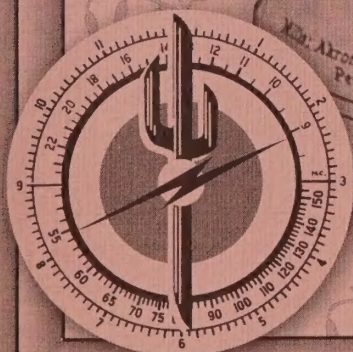
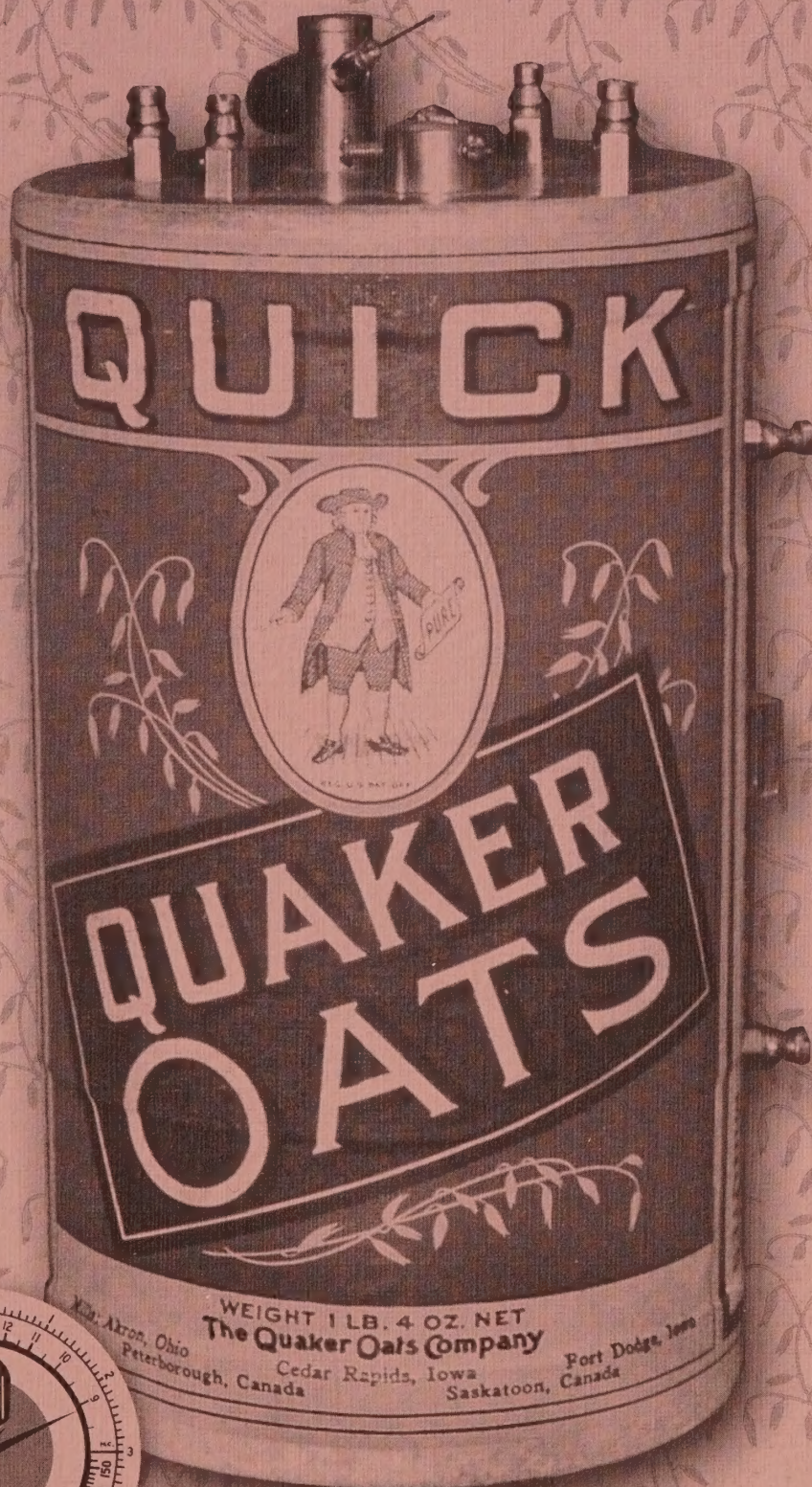


ARIZONA ANTIQUE RADIO CLUB NEWS



Vol XXI, No 1 2004

3 AARC News

6 Vintage Green Radio: the AN/GRC-109
by Harry Synovetz

12 I Can't Believe Someone Did This to a Radio!
by Ken Krol

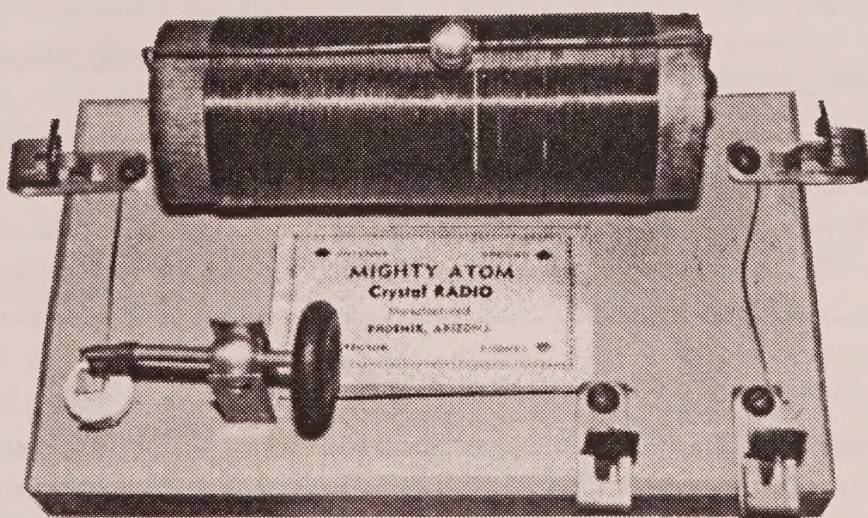
14 Vernon Furr and the Mighty Atom Crystal Set
by Ed Sharpe

22 The Westcraft
by Clyde Watson

26 1921, '31, '41 and '51 Radios
2004 Radio Roundup, February 21, 2004

38 AARC Members 2002-2004

40 X-L Products Brochure



ARIZONA ANTIQUE RADIO CLUB NEWS
Vol XXI, No 1, 2004



Arizona Antique Radio Club

www.azarc.org

The Arizona Antique Radio Club was organized in 1983 for the preservation of the history and artifacts of radio and television, and for the advancement of knowledge and appreciation of radio technology and communication. The Club is a non-profit corporation organized primarily for the mutual assistance of radio devotees and collectors in Arizona. Membership, however, is open to any persons who have an interest in radio and television history, preservation, restoration, and collecting.

Meetings are held from October through May and consist of touring collections, presentations of technical, historical or restoration information, thematic displays of radios and the autobiographical experiences of the members. We hold antique radio Swap Meets two or three times per year. Members of the Board of Directors are elected at the Fall Swap Meet in November. Most meetings are held on Saturdays in the Phoenix and Tucson areas, and when possible, elsewhere within Arizona. Meeting schedules, information and maps can be found at www.azarc.org.

Membership dues are \$10 per year, due in January and provide access to all club benefits including the current issues of the *Radio Club News*. Send dues or membership inquiries to: John Martin, 2105 E. Stephens Rd., Gilbert, AZ 85296 (phone and email below).

The *Arizona Antique Radio Club News* is the publication of the Arizona Antique Radio Club, Inc. It is mailed First Class to current members.

Contributions: submission of articles, news items, fiction, photographs and other materials relating to radio history and collecting are greatly appreciated, particularly if they have an Arizona connection. All members are encouraged to broaden their interest in the hobby by sharing their experiences, opinions, knowledge and observations with the club through its publication. Send materials for publication to Bill Lettow, 2025 E. LaJolla Dr., Tempe, AZ 85282 (phone and email below). For membership info and changes of address contact John Martin, 2105 E. Stephens Rd., Gilbert, AZ 85296 (phone and email below).

Entire contents copyright © 2004 by Arizona Antique Radio Club, Inc. unless otherwise indicated. All rights reserved. Please contact the Editor for permission to reprint articles or artwork in other publications.

Radio Club News Contributors:

Ken Krol

Harry Synovetz

Editor: Bill Lettow

2004 Board of Directors

President:	Steve Smith	480-831-3095	radio747@yahoo.com
Vice-President:	Pete Way	602-840-7184	bakeapple@earthlink.net
Secretary:	John Martin	480-892-2074	nightsight01@getnet.net
Treasurer:	Mike Brown	480-668-7541	mikebrown@antiqueradios.zzn.com
Editor:	Bill Lettow	480-730-6058	lettow@yahoo.com
Webmaster:	Jeff Shields	480-855-1282	jeffandkt@msn.com
Directors:	Dennis Craft	480-510-3054	dcraft@qwest.net
	Stephan Lew	520-881-0385	slew2969@aol.com
	Carl Roberts	480-998-0680	tswcarl@netscape.net



DO YOU STILL WANT A RADIO CLUB ?

Are you about to attend your last antique radio swap meet in Arizona? Is this the last journal you'll receive? Are you ready to say goodbye to your radio friends?

As your Editor for more than 10 years, and as a Board member for longer than that, I can tell you with certainty that your radio club is close to folding. Shutting down. Fading away. Whatever you want to call it, we're in trouble folks.

For many of our early years, we teetered on the edge of being broke. We had plenty of enthusiasm but no money. Today the situation is reversed. We have money, not a lot, but a comfortable amount. But when it comes to enthusiasm, we're about broke.

Our membership has stayed steady in numerical terms. You could argue that it should be rising steadily as the population has risen. Our Fall Swap Meet is usually well-attended, although it too has not risen and it has suffered, as swap meets all over the country have suffered, from the focus of buying and selling moving to online and commercial auctions.

Our other functions have seen a decline in attendance and participation. This has been happening for about 5 years now. We have had some very exciting meeting locations in the

past few years where an embarrassing low turnout has been almost insulting to those who opened up their collections for the club. And participation in our journal has been so disappointing as to make getting even one journal out a year into a struggle.

So where do we go from here?

My personal view is that this is a two-sided problem. On one side are the members: you. What do you want? Are you voting with your feet by staying away? Are you bored with our activities, have you moved on to something else? Is the current club format, now 20 years old, no longer of interest to you? These are the questions your Board thinks about. Thinks, because we're not hearing from you.

The other part of the equation is Leadership, and here we come to the current crisis. We have 9 Board members. Five are up for election this year, but 4 have chosen not to run. One may run and we have one volunteer willing to run. Of the remaining 4 members, two of us have served for many years and would like to see some new energy come on to the Board. The final two are willing to serve but have careers that prevent them from shouldering a lot of responsibility.

It is this combination of exhaustion of spirit and time limitations that has been deadly for the club and has resulted in poor communications, lack of planning and failure to follow through on new ideas and plans.

If we still want a radio club, some new people are going to have to step up and help to run it. We can't have our traditional activities, or any new ones, without an active core of leaders

willing to take on and follow through with what needs to be done.

It won't happen without you. If you do care, and can help, please consider contacting the President and volunteering for the Board. Elections will be held at the swap meet on November 13.

MORE COMMENTS ON THE CLUB

Harry Synovetz wrote in with these comments: I have read Dan Nelson's comments in last year's newsletter (received August 2004) and have to agree with his observations and suggestions. Let me add a few of my own based on my experiences in other collector organizations.

The club needs to focus, right now, on two things that are sorely lacking, communications and membership.

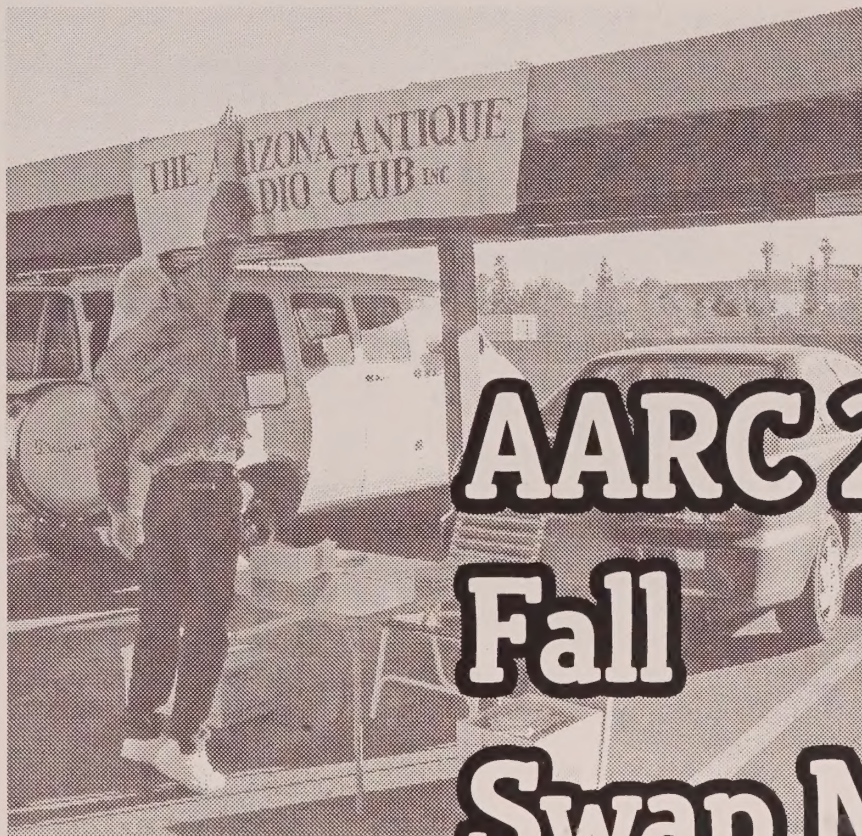
There should be no excuse why such a diverse group of collectors and radio enthusiasts cannot provide enough written material for 3-4 bulletins a year. To begin with, we should have a President's Report outlining his vision for the club during the next year, and its progress. A Treasurer's Report should share the club financials with the membership. A Secretary's Report should inform of the membership status, demographics, recruiting efforts and results. These simple reports from the club's officers can serve as the core of the periodic bulletin. Members should also be encouraged to submit Want/FS ads and more permanent business card adverts at both no and reduced fees. Photos and attendance of club activities could also be added. Dan's suggestions for article submis-

sion should be pursued and members should be encouraged to submit even a few paragraphs or photos for each issue (that includes "this" lazy arse).

The other area that we should NOT take for granted is membership. Numbers, quite frankly, bring dollars (dues). And the more funds an organization has, the more discretionary or "fun" things it can do. The club leadership should consider advertising the open swap meets to the public. I tried doing that during the last Winter meet here in Tucson, and found a wide variety of outlets. Most radio, television, and cable providers have Community Announcements for Public and not-for-profit events open to the public. All free. The same with nearly every newspaper. I also found that local Antique Malls were glad to display the club literature. If we only signed up 5-10 new members each event we could be way ahead of the attrition power curve. I wonder how the membership has fluctuated over the last few years. Successful organizations pay close attention.

Personally, I'd also like to see the club have a short 30 minute business meeting at each swap event. The swaps usually are "over" by 11am, so why not a membership meeting at that time? An incentive of a soda and hotdog might help. And why not a club table for an "admission fee" of something to sell or swap? How about a thematic contest for each meet, Favorite Radio from the 50s, etc? There are lots of "fun" things that could add to the value of the club.

So what do you say Board of Directors?



AARC 2004 Fall Swap Meet

November 13, 2004 • Antique Electronic Supply, Tempe • 8 AM
Auction • Food • Raffle • Elections

You must be an AARC member to sell at the swap meet. Lot not open before 8am. Please don't block Qwest operations by parking on the southernmost side of the lot.

Tentative 2005 Dates - Mark your calendar - Details to be announced

January 22, 2005
Tucson Swap Meet

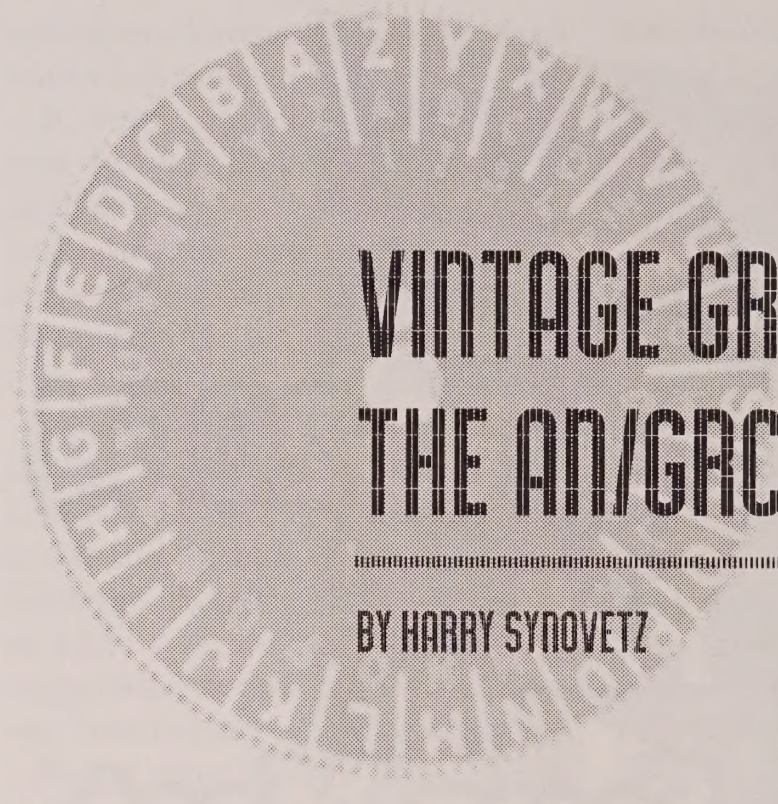
Location and details to be announced.

February 19, 2005
Radio Roundup

Paradise Valley Public Library - Campbell Branch - 17811 N. 32nd St.
An Art Deco-related theme to be announced.

March 19, 2005
Spring Swap Meet

Location and details to be announced.



VINTAGE GREEN RADIO: THE AN/GRC-109

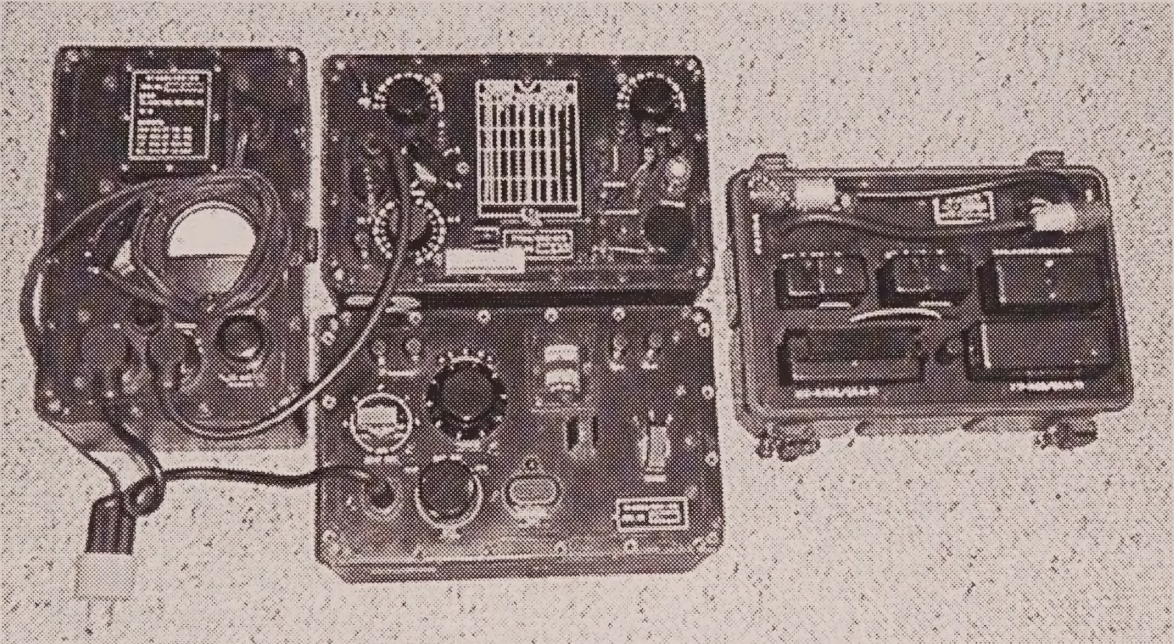
BY HARRY SYNOVETZ

One of my radio collecting interests for many years has always been Military, or “Green” radios. I suppose it started as a youth when I would see surplus radio gear for sale at the local Naval Air Station’s property disposal sales. And later, the fact that one of my assignments while in the US Army was that of Communications Officer for an Armored Cavalry Squadron didn’t help either.

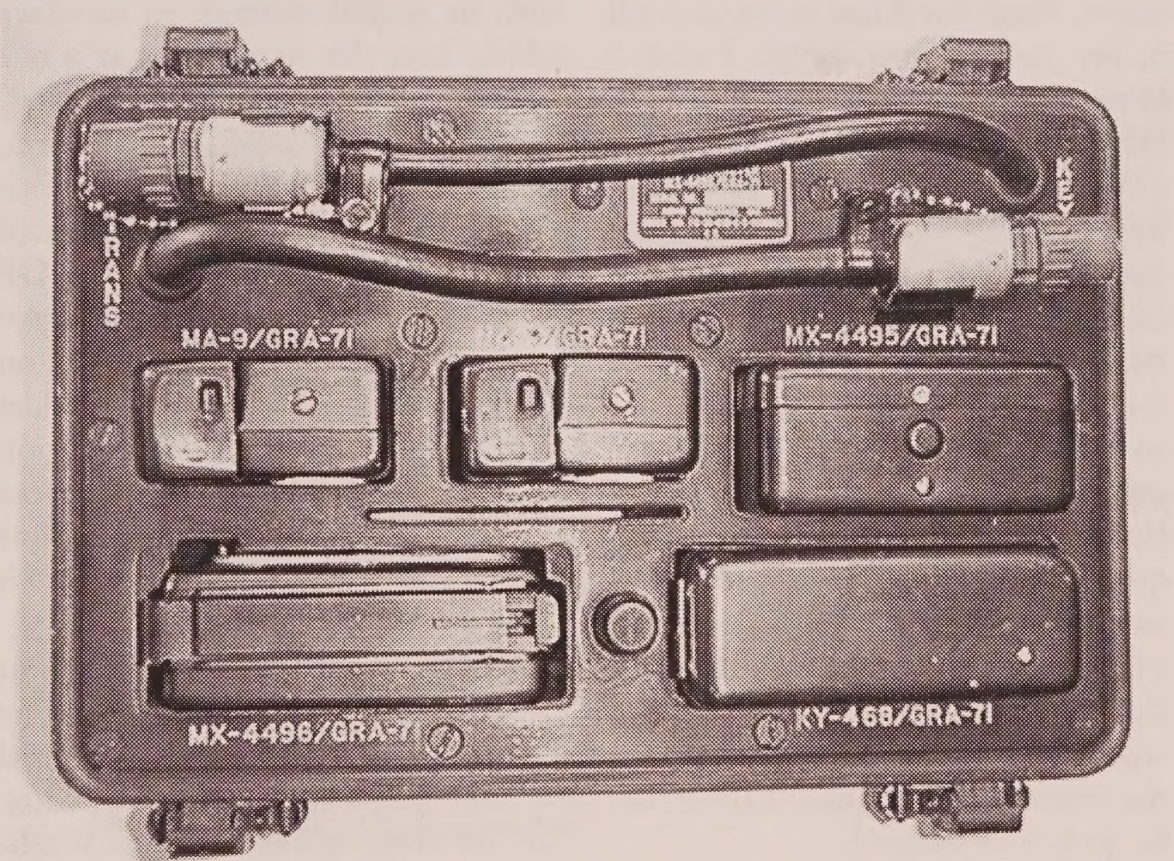
A few years ago, I acquired a complete AN/GRC-109 station. The -109 is the military version of the CIA Radio Station RS-1, “Spy” or clandestine HF CW modular transceiver. First manufactured in the early 1950s, it consists of a crystal controlled transmitter T-784, A VFO/crystal controlled receiver R-1004, and a choice of either an AC only or AC/DC power supply, which could operate on nearly any worldwide voltage/frequency or from a 6v tractor battery.

The -109 could cover a frequency range of 3-24 mhz and has an output of approximately 12 watts. The US Special Forces began using this radio in the early 1960s in Vietnam to communicate with Montagnard tribesmen being advised by the Green Berets. For me it was a nice little CW radio, and if you are patient enough you can zero beat SSB and International Broadcast stations. What was missing, my “Holy Grail” of radio gizmos, was the GRA-71 Code Burst Generator to go along with it. Very few of these code bursters have been surplused out over the years; in fact, the -109 was in use by many Reserve units until the late 1980s.

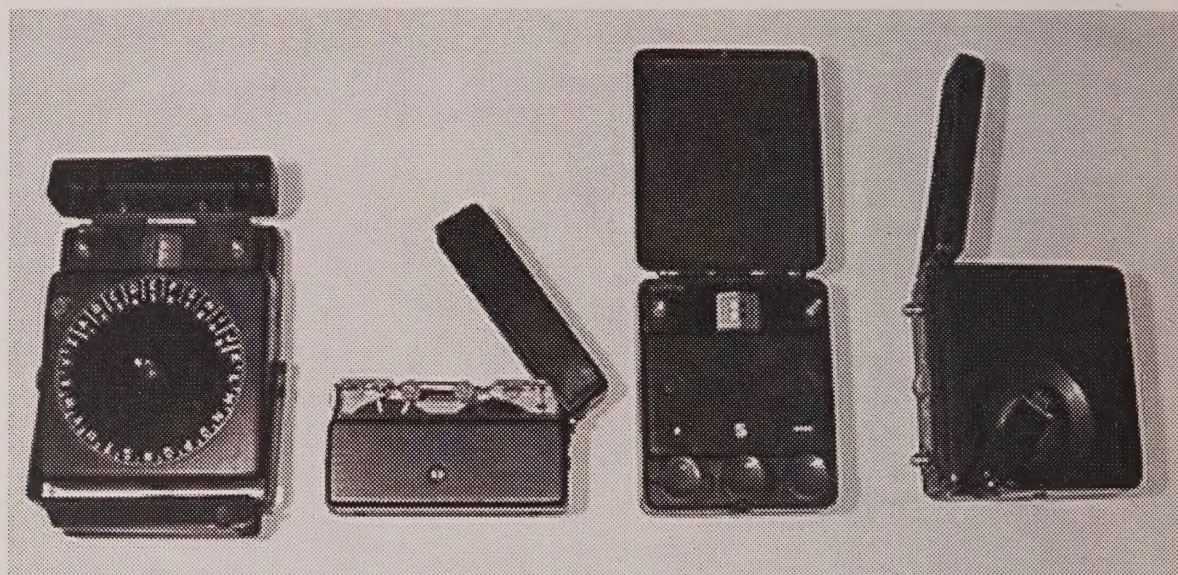
Then, during my annual sojourn to the Dayton Hamvention in Dayton Ohio, that “Woodstock of ham radio” as someone in the club once remarked to me, it happened. After walking through the flea market for about 4



AN/GRC-109 Radio Components w/ AN/GRA-71 Code Burst Generator on right.



The complete GRA-71 in its transit case, which houses the interface electronics for data transmission.



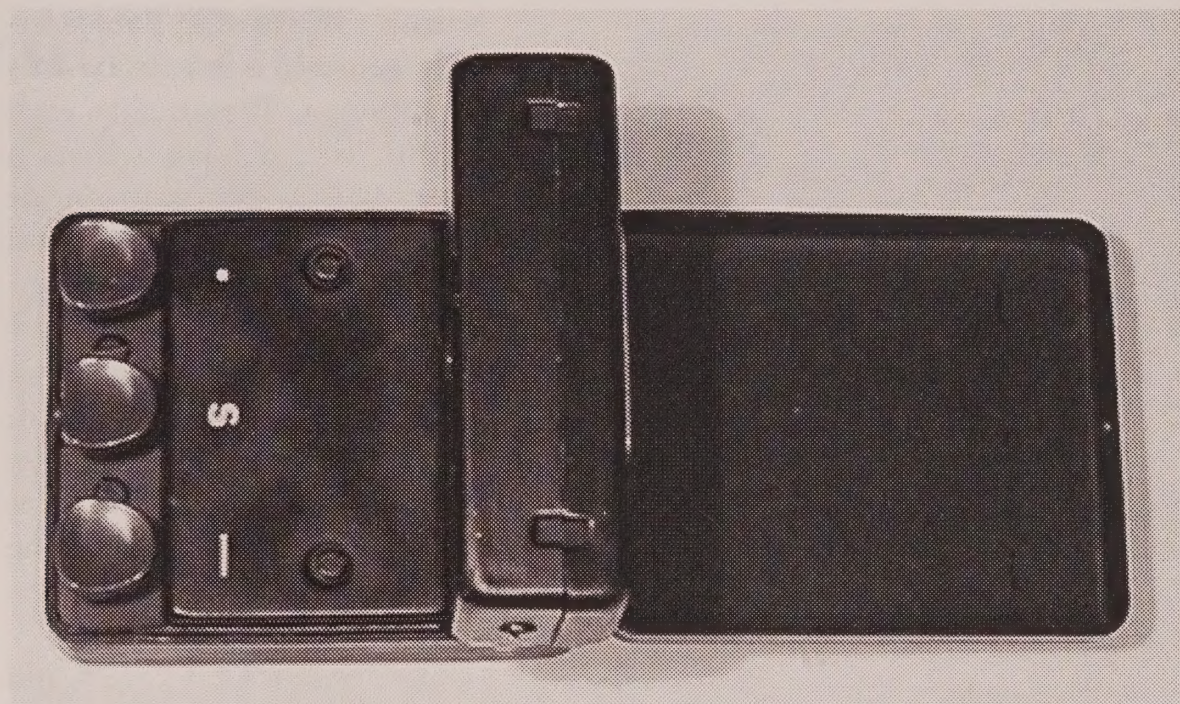
L to R; Rotary Encoder, Tape Cassette, Push-Button Encoder, Keyer

hours (there are over 2000 flea market spaces), I noticed another pile of green radios. Since I still had some cash left in my pocket (amazingly), I took a look. Among the green de-milled SINCGARS and PRC-47s I noticed a black aluminum box. I expected to find another -109 component and decided to take a look out of idle curiosity. To my surprise, it was IT! After chatting with the seller, and noting that the unit was in as-new condition and complete, my remaining cash defied Einstein's Theory of Relativity and flew into his hand quicker than light thru a goose. The sun shone thru the parted rain clouds, a Choir began singing Hallelujah in the background, and everything got sepia toned and blurry. I had done it, the quest (insert maniacal collector's laugh here) was over!

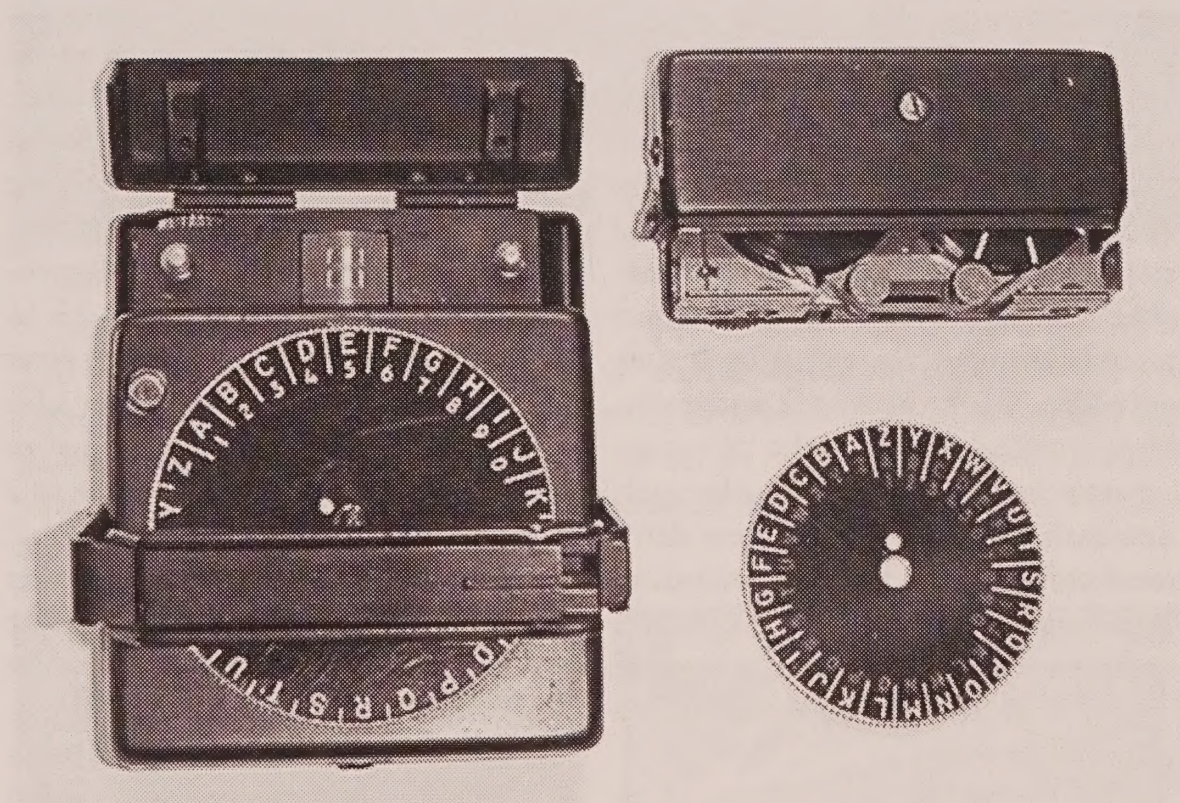
The GRA-71 is a device that allows a radio user to record a coded morse message on a small magnetic tape cartridge, either thru a pushbutton device that the user can type individual Morse characters, or thru a wheeled

device that has individual alphanumeric characters. This cartridge can then be played through an interface which keys the transmitter at a rate of 300 wpm (words per minute). This creates a "burst" transmission, sounding like a long belch, which theoretically cannot be intercepted long enough for the enemy to DF and locate your position. The signal was recorded on the receiving end on magnetic tape also, which was then immersed in an indicating solution and the individual dot and dash tracks were interpreted. It was also possible to record the data burst and replay it back at slow speed.

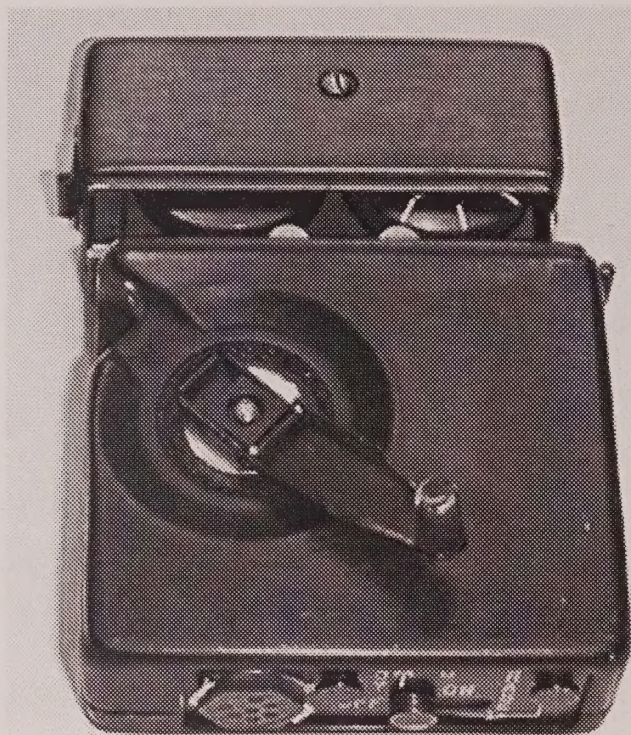
Admiral Corp manufactured most of the GRC-109 equipment. The GRA-71 was initially manufactured by Stenographic Machines, Inc. Later, Arvin Industries outbid them for subsequent lots. The ensemble consists of 2 tape cartridges, a rotary encoder, a push-button encoder, and a spring motor driven keyer. The aluminum transit case contained the necessary electronics to key the T-784 transmit-



MX-4495 Push-Button Encoder w/tape Cassette



MX-4496 Rotary Encoder w/tape Cassette. Note exposed recording heads and scrambled text spare wheel.



KY-468 Keyer with attached tape Cassette.

ter, and orphaned it's power from the transmitter. It was also waterproof and could be buried until needed.

The tape cassettes each contained 12.5 ft of 3M Instrument Grade recording tape, which was user replaceable. This tape was spring wound, and would automatically rewind itself after encoding. Both the rotary and push-button encoders drove the tape past separate recording heads (one for each dot/dash character) thru a gear drive mechanism. The electrical recording impulse was generated by a simple coil and armature mechanism. The cassette would hold at least 125 5-letter words plus word spaces.

The recording could be accomplished anywhere. In order to transmit the data, the KY-468 keyer had to be used. The operator would wind the enclosed spring motor, plug in the tape cassette, and then push the IDY

button. This would automatically generate a stream of dots at 300wpm. Presumably each station would have a certain ID period length to preamble itself. Then the operator would play the tape, at 300 wpm. It traveled at 4.5 in/sec, the dots being 3.3mS in duration while the dashes were 10mS in length. There was also an erase function in the keyer, where the operator could erase the cassette in a manner similar to the playback.

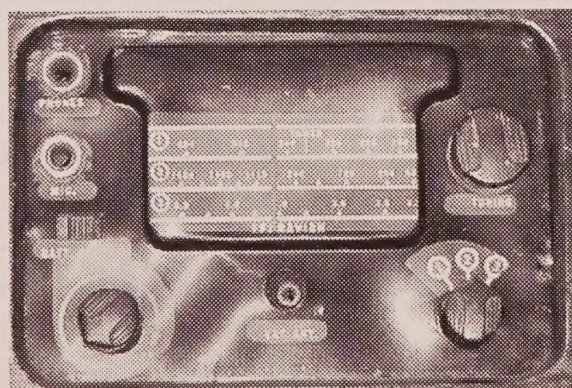
Of course, with whom could I try to communicate with this device? I distinctly recall that while serving as an Intelligence Officer in the Army there were periodic reports of burst transmissions intercepted throughout the United States. We presumed they were from Soviet Bloc agents. Perhaps they may have originated with radio enthusiasts also. The Army used the Recorder-Reproducer Sound Set, AN/GSH-17 in conjunction with the R-390 Receiver to capture the data bursts. They also used a solution called Magna-See to visually develop the tape similar to a photographic process.

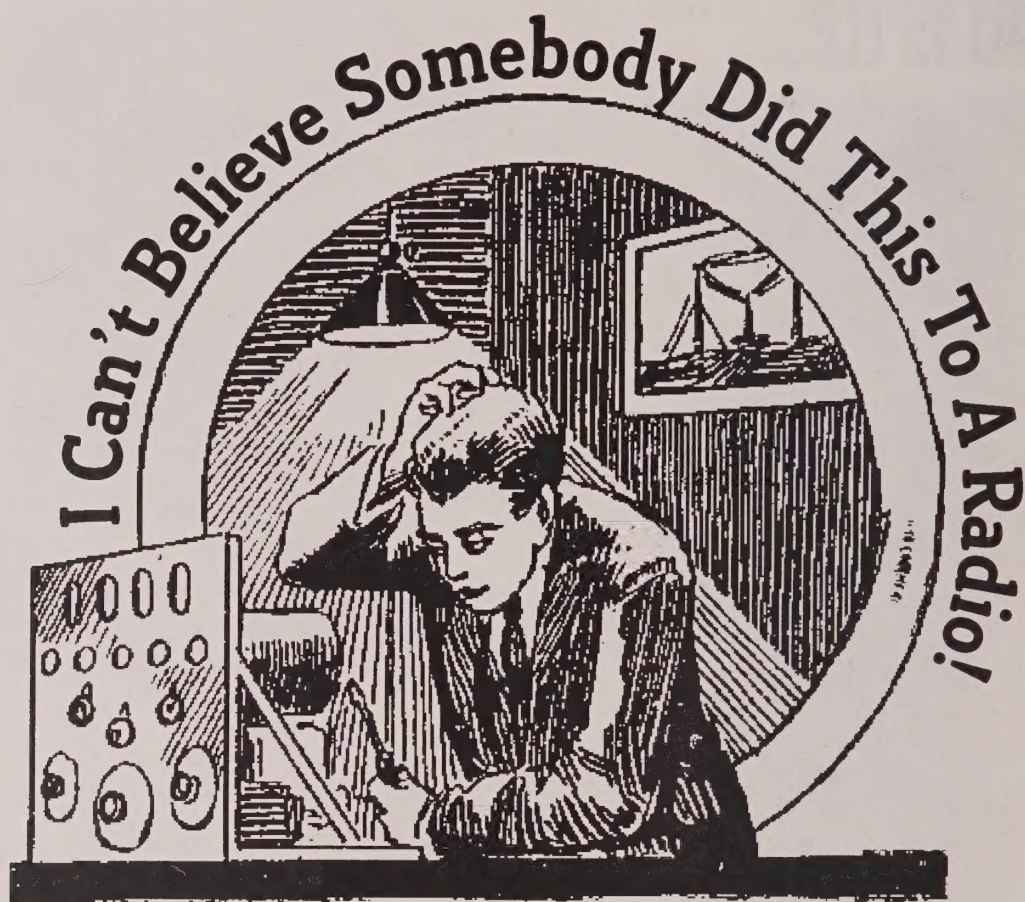
Vintage green radios provide a rather unique collecting area to pursue. The USAF produced it's version of the AN/GRC-109 known as the RS-6. This very compact unit was stored in the ejection seats of B-47 Bomber aircraft. Supposedly the crew would report the success of their mission after bailing out during nuclear strikes on the Soviet Union. Nice concept, but who would be listening? ❶

WHAT IS IT?



This is a LearAvian Model RM 402 C 3 band radio. Tunes 2.25 to 6.0 mhz, 550 to 1500 khz, and 200 to 400 khz. Slide rule dial is reversed, scale is from right to left. I presume this is some mid 1940s portable pilot's radio, but haven't found any information on this model. It has a microphone input, for what purpose? Doesn't appear to be a transceiver. Battery, AC/DC, requires an external antenna. Any ideas?





by Ken Krol

Any of us who repair antique radios have seen many mistakes made by good-intentioned people trying to work on a radio. I cringe when I pull the chassis out of a newly acquired set and find a sea of mismatched, poorly installed capacitors. Especially when the seller has told me it doesn't play. Oh well, I guess it never hurts to brush up on your schematic reading skills. Generally, they hooked a capacitor to a wrong tube socket pin or didn't realize that resistors open up or that coils and IFs go bad. On a set like this I just start over, comparing everything to the schematic as I go.

Of course, everyone can make a mistake. That's why it's so nice to see a

full set of OEM capacitors in a factory original set. At least you won't find stupid wiring errors in an untouched set. Well, not usually.

Zenith, the zenith of quality. Not gonna find any goofs in one of these babies! One 10 tube 1930s console upon which I was doing a complete electronic restoration had eight unsoldered joints. But it got worse.

Work complete, it fired up but was very weak from the middle of the AM band down. All the usual suspects were checked: alignment, weak oscillator, voltages. Everything checked. As a last resort I decided to check the bad switch. Flashlight in hand I spotted the problem. When the factory was

wiring it, somebody slipped one of those hair-thin coil leads through a switch terminal, all the way through, until it touched another terminal on the section behind it. A quick snip and the radio was playing perfectly. How did this slip through and why was it never brought in under warranty? Maybe all the original owners' favorite stations were on the high end of the band?

A wreck of an RCA model 100 cathedral drew me at an AARC swap meet many years ago. The gentleman said \$20, but it's only for parts. To me, there's no such thing as a parts set, so I gladly gave him the money. He even threw in the cardboard box to hold all the parts and pieces!

Once home on the bench it underwent a thorough electronic going-through. It obviously had had many folks working under it's chassis over the years, and many problems were corrected, but once fired up the RF was completely dead. Troubleshooting began, and it looked like an open coil. As a shortcut to attempt to reach test points under the crowded chassis, I used a grid cap lead and the chassis to test one coil's secondary. When I read zero Ohms, a short, my first thought was a tuning capacitor short. I open it all the way. Still shorted. I unsoldered the effected lead. Still shorted. I moved the test leads to the tuning capacitor itself and got the proper reading for the coil. Further under-chassis examination revealed the grid lead in question ran from the cap, through a grommet, under the chassis, directly to ground! Well, the man did say the radio was for parts...

I guess a previous buyer of the parts set need a grid lead. Fast forward to the following owner, attempting to get the set playing. The grid cap was missing and two leads came through the chassis. One was the antenna, ergo, the other must be the grid lead, so this one got the cap soldered to it. I kind of wondered why it was so long. Moving the wire to the correct point got the set working perfectly.

Next case: A wonderful Jackson-Bell shouldered tombstone, a great find with push-pull 45s and a perfect original eight inch speaker shoehorned into the cabinet. This one should sound great. An easy job of replacing all of the original caps and a few resistors and it was ready to fire.

Well, back to the bench. No sound, so troubleshooting began. Now let's all be honest. Isn't this what we really hope will happen when we fire up a set for the first time? I think it's just human nature to want a challenge. A systematic approach brought me to the interstage transformer. Ohmeter leads in hand I checked the wires going to the grids and got a good reading. Now the center tap. Why does this transformer have only four leads?

Believe it or not, someone replaced this transformer years ago (very old transformer) with a single-ended unit, making no provision for a ground return, and apparently expected it to work! I can just imagine the story the shop told the customer about their set being unrepairable.

So there are a few good stories. Let's hear from you and maybe we can make this a regular feature! 

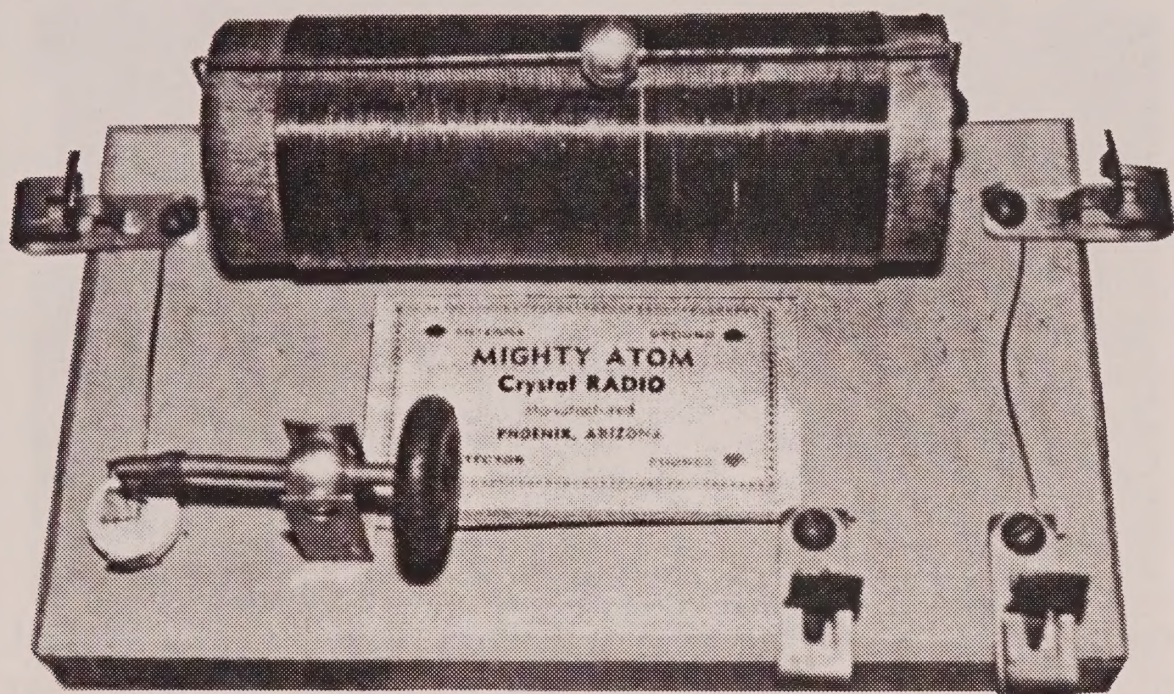
Made in Arizona:
VERNON FURR and the
MIGHTY ATOM Crystal Radio



by Ed Sharpe

One evening I purchased a small crystal set that, according to the label, had been manufactured in Phoenix, Arizona. Up to this point I had not been aware of any early organized radio manufacturing in the state.

Knowing I needed to learn more about this, I



checked with Maury Sievers. I knew his main interest was crystal radios. Maury had two of these sets, one with a red base and one with a yellow base. At this point I remembered seeing one that looked similar in my box of incomplete crystal sets. It had no label on it, so I never knew who made it. This set had been given to me by a friend who had found it in a thrift shop 12 years ago. It was missing the detector and the label, of course, that would have provided a clue as to its origin.

On the phone Maury and I compared notes about the set I had and the two in his possession. The labels were slightly different. His was in

black and white and mine had some color to it. As you can see in the photo, the name on this set was MIGHTY ATOM. Maury's says THE MIGHTY ATOM, and does not have the markings denoting where to hook the antenna, ground, etc. Also, on the version he has, the label includes the words "CRYSTAL CLEAR".

I remembered that my friend had mentioned that the fellow he had gotten the crystal set from was the individual who had actually made it and others like it. At this point I decided to document this radio a bit better, and find out all about how and when it had been built. I called my friend and discussed it with him to find out how much of the story he knew. After a bit of fact gathering, I called a man named Vernon Furr and made arrangements to interview him.

A rather interesting thing came about when I called Maury Sievers back to fill him in on the fact I had

This article first appeared in the Summer 1988 issue of the AARC News. In 1991, Maury Sievers published his definitive book on crystal sets, the title of which, Crystal Clear, was inspired by the label on the Mighty Atom set.



discovered who the maker was and that the maker was still around. As we were talking I imagined a box of crystal sets kinda buried under a bunch of stuff. I mentioned to Maury, not only will I do an interview, but, who knows, maybe I will find a case of crystal sets also!

Well I headed out from the office along with a fellow that works at Computer Exchange with us, Charles Fala, an engineering student at NAU. He has a general interest in electronics, and wanted to meet the builder of the MIGHTY ATOM crystal set. Armed with state of the art cameras and cassette recorders, Charles and I set out on our quest.

I had a very enjoyable chat with Vernon Furr about how the set came about, when it was built, and, general radio topics from the early days. Here is a partial transcribing of some of what we talked about:

Ed: What got you interested in radio to begin with?

Vernon: I had a crystal set similar to this. A friend of mine got it some place and I copied it.

Ed: What year was this?

Vernon: It was before I got married, so it would be 1929. It was before the depression really hit hard out west here.

Ed: When did you start your radio shop?

Vernon: Well I started it more or less after I got that crystal set. And then I got interested in public address systems. The politicians wanted them for meetings at different places... I had bought some horns and an amplifier, a condenser microphone from KOY. I paid two hundred and some dollars for them.

Ed: Where did you buy all the parts for these radios?

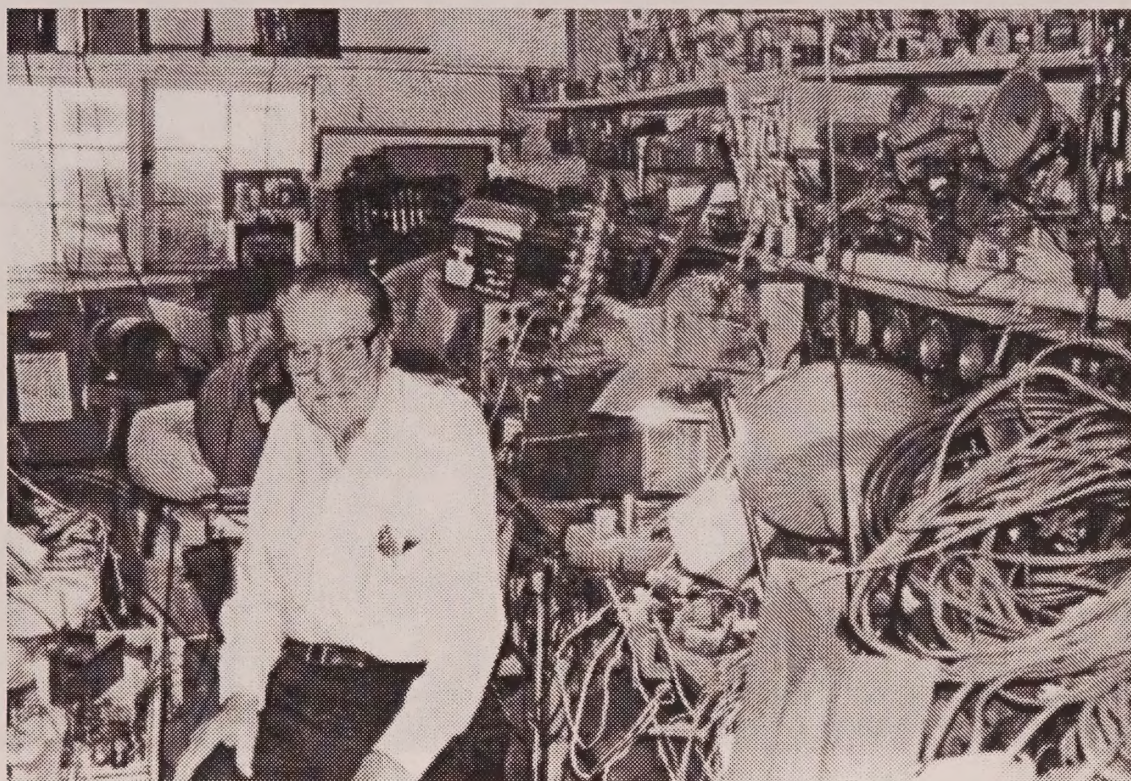
Vernon: I got some of the parts from Wholesale Electric, and I got the wire from Electric Rewind in Phoenix.

Ed: When was this radio made, Vernon?

Vernon: This was before the war you know. Hitler was starting his business but there was not a war for us yet.

Ed: Did you continue making them during the war?

Vernon: I quit making them before the war.



Vernon Furr in his workshop in Mesa. Recovery site of seventeen Mighty Atom crystal sets.

Ed: How many of these radios did you make and sell?

Vernon: Around 200 or 250, that's about the size of it.

Ed: I notice that the label says Phoenix, Arizona? But your radio shop was in Mesa. Why Phoenix?

Vernon: We used Phoenix because it was a bigger town, and I got some of my help from Phoenix also.

Ed: What did this crystal set sell

for?

Vernon: What did I get for those thing... A dollar and a half I think.

Ed: What did it cost for the parts to build it?

Vernon: I made a 50% profit, I think 75 cents.

Ed: On a radio like this, Vernon, how many stations could you receive?

Vernon: KOY and KFAD were the only two that would really work; they



**FURR RADIO &
TELEVISION CO.**

SALES AND SERVICE

PHONE 3130

VERNON FURR, OWNER

211 SOUTH ROBSON
MESA, ARIZONA



Vernon Furr with his first tube receiver, built in 1923 or 1924.

were both pretty powerful stations. They had antennas on the buildings. It was before they had antennas on South Mountain. KFAD later became KTAR. I had a friend named Andy Anderson, he was the Chief Engineer at KFAD. I used to go up and see him and fool around with radios and things with him.

Ed: So what was it like having a business during the depression?

Vernon: Things were so hard you could barely get anything to eat! When the war came along things got a lot better. In addition to working with radios I also worked in theatres as a projectionist.

Ed: What were the radios that sold during the depression?

Vernon: Well, Atwater Kent was a real popular one, but there were RCAs etc.

Ed: When did Furr Radio close?

Vernon: I had a nice shop on North

McDonald in Mesa, and after my wife died, it was 1950, and I got in the projectionist's union and went to work at the theatre full time. In 1950, I had to close the shop, I wasn't making enough money to navigate with... I am still working as a projectionist at Metrocenter two days a week.

Ed: You are still working at almost 84 years old?

Vernon: As long as I can thread a machine I still will be working! I don't really want too many hours, but I enjoy it.

After a long chat, Vernon took us to a shed behind his house in Mesa, where he said, "I have some of those radios over in the corner there." Climbing over the piles of old 50s radio chassis, gutted record changers and remnants of TVs, I got to the corner of the room.

What I saw when I uncovered the



Vernon's wife, son and 1934 Ford service truck.

box of radios, was as I had imagined what would be found when I let my imagination wander in the early part of this story during my conversation with Maury Sievers. There they were, just as I had imagined!

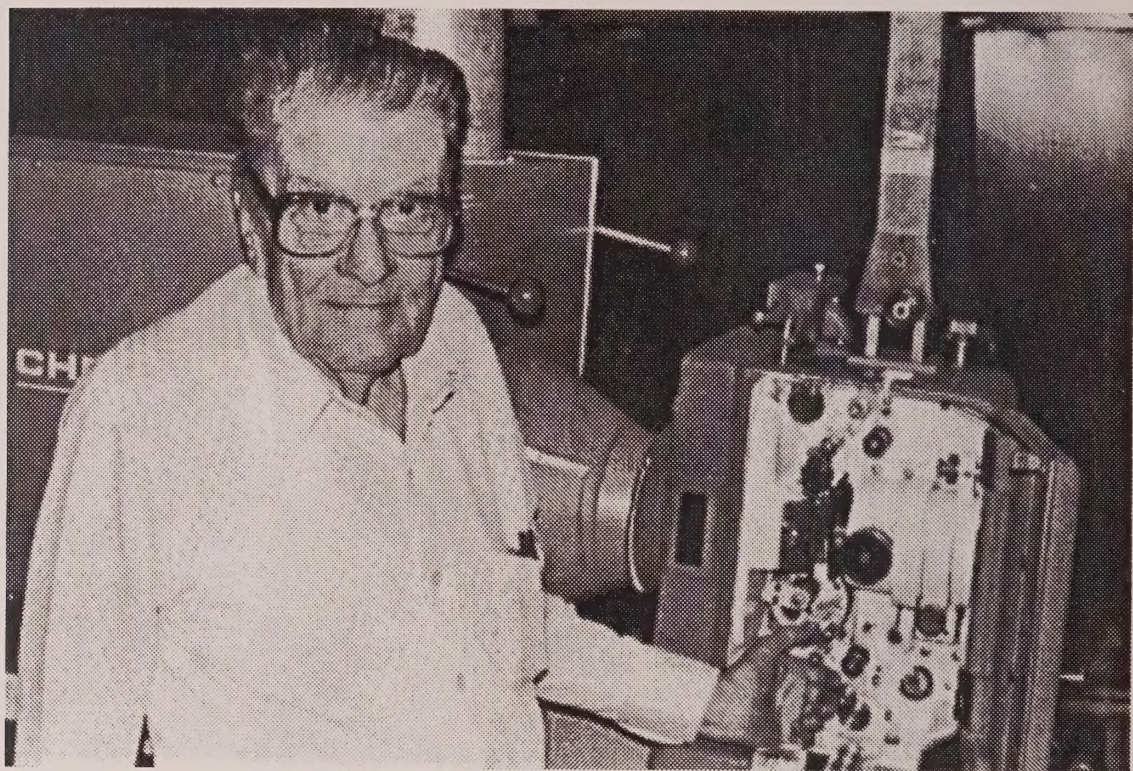
Feeling like Carter when he discovered the treasure of Tutankamen's tomb, I knew we were becoming archeologists unearthing fragments of a past era of radio history. A whole box of MIGHTY ATOM crystal sets! And judging from the amount of dust and spiders around there, it looked as though they had been there in that very spot since the date of manufacture!

After some digging and shuffling, Charles, Vernon and I passed the box over the piles of radio chassis and out the door into the sunlight. The final count when we laid everything out to look was 17 radios. Some were missing the Philmore type detector but were

in nice condition, a few of them even being still wrapped in the paper from the time when they were building them. There were also some bases for radios that had not been built. These bases had been drilled to mount parts on and painted, but did not have the label or parts affixed to them. There was also one tuning coil that had not been used.

I really did not need 17 of the same model crystal sets, but figured that some of the other folks that are interested in old radios would like some also. I proceeded in a lengthy negotiation for the entire box of crystal radios. After much discussion, and more looking around, we decided to call it a day and Charles and I loaded the sets into the van.

It seems from the stock of remaining radios, they came in yellow, red and forest green on their base boards. We ended up with one yellow radio, nine



Vernon operating a Century film projector at Metrocenter Theatre.

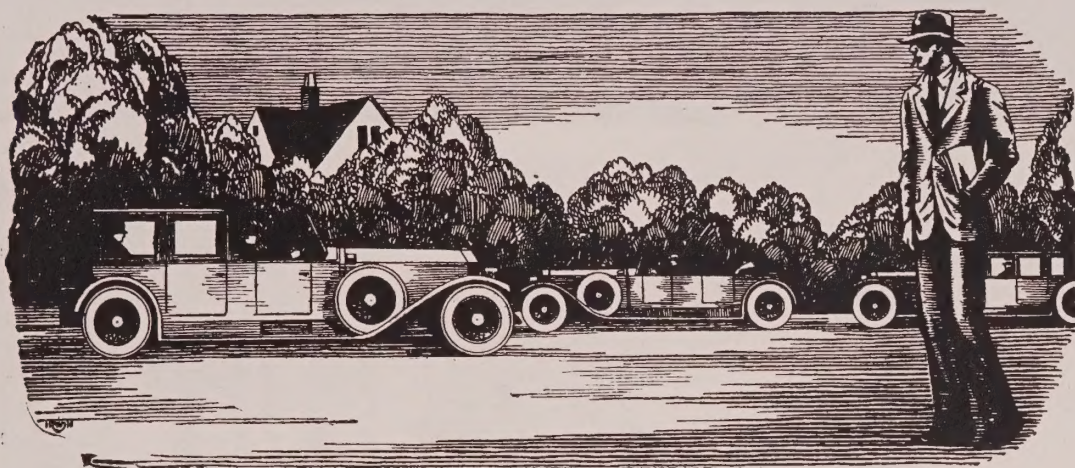
red and seven green. I am going to keep one of each color for the display of antique radios, telephones, and electrical equipment we have at THE COMPUTER EXCHANGE, and the duplicate radios are for trade or sale to any other interested radio collectors. As these are part of local history, I want to see them stay inside the state and would like to sell them only to collectors who reside in the state.

EPILOGUE: It is with deep regret

that I add an epilogue to this story. Vernon was looking forward to seeing this story and the photos in print, and coming to an AARC meeting. He loved talking about the old days of radio and sound systems. On June 19, 1988, a few days after my interview with him, Vernon Furr suffered a massive cerebral hemorrhage which ended his active life. He will be missed by those of us lucky enough to have known him. ☹



Vernon Furr and the author, June 1988.



I Thought Success Was For Others

*Believe It Or Not, Just Twelve Months Ago
I Was Next Thing To "Down-and-Out"*

Many times in the old days, while I trudged home from work to save carfare, I used to gaze enviously at the shining cars gliding by me, the prosperous men and women within. Little did I think that inside of a year, I, too, should have my own car, a decent bank account, the good things of life that make it worth living.

One day I thumbed through a little book on my table and saw an advertisement I had seen many times and passed over without thinking, an advertisement telling of big but intangible rewards for writing articles related to the exciting field of Antique Radio.

I inquired further and learned that by sharing my experiences, expertise, wisdom, common sense, opinions and observations with club members I would become known as a real swell guy, who no longer had a "wish-bone" where my "back-bone" ought to be.

I had so many ideas in the Radio line that I quit my measly little clerical job and devoted full time to writing. This new live-wire field held an abundance of golden ideas for articles:

My first radio

Great and impossible finds I made

Tips for making finds

Tips for new collectors

Great finds that turned sour

Tips to avoid making finds that turn sour

Interviews or visits to club members

How I got started in radio

Experiences in radio's early days

Early Arizona radio: stations, manufacturers, stores, personalities

Interviews of radio pioneers

Job experiences relating to radio

Cabinet restoration tips

Chassis repair tips

Great and impossible restorations

Electronics for the beginning collector

Technical help in question and answer format

History of a set, a company or a station

Development of circuits, tubes or components

History of a design trend, i.e. art deco

Any aspect of radio in Arizona history

Unusual sets

Recent acquisitions

Before and after shots of a restoration

Collections or swap meets visited

Interesting radio related places visited

The state of the hobby

Letters to the editor

Comments about articles seen

Comments about the Radio Club News

Opinions about prices

You may not be as bad off as I was but think about it - are you satisfied? If not you should be writing something for your radio club. The Editor (address on page 2) was real helpful and will help you too.

ANOTHER ARIZONA-BUILT RADIO ...

THE Westcraft

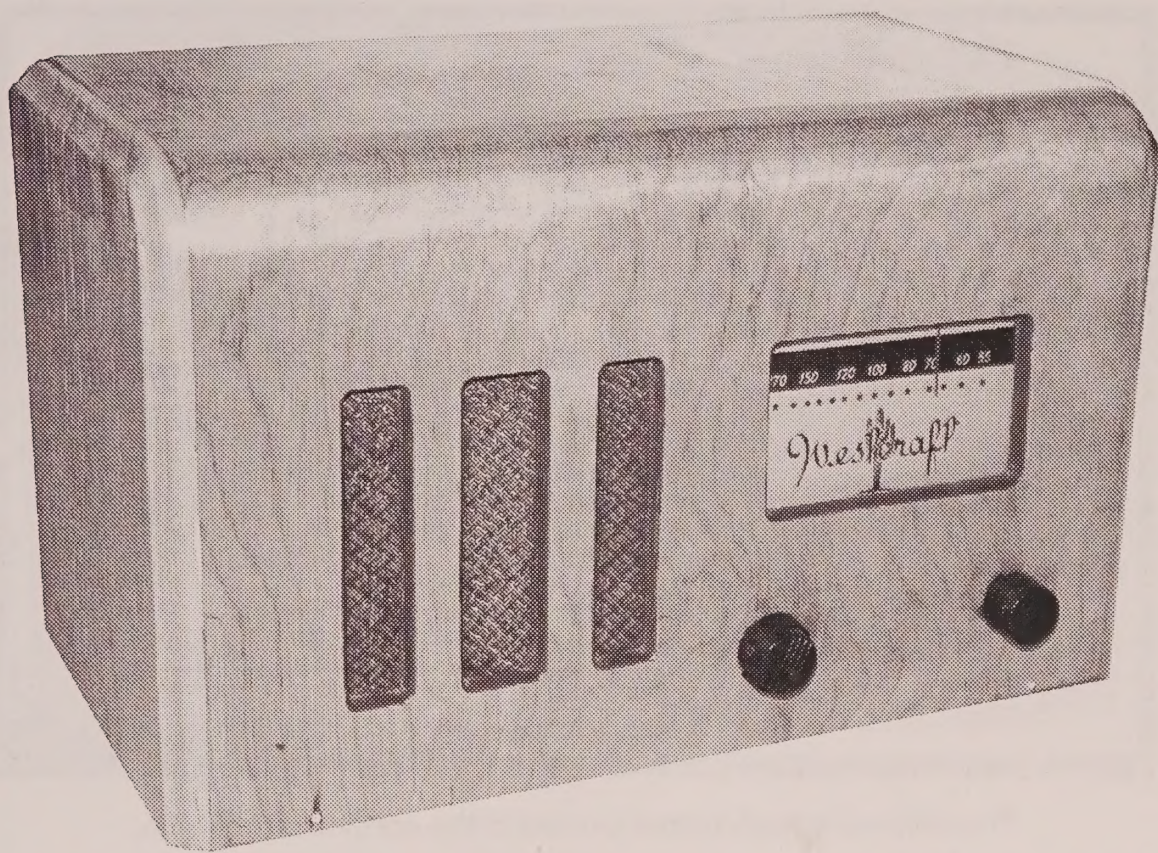
BY CLYDE WATSON

It would have been easy not to give it a second look. The plainness of the shape showed little promise that it would be unusual in any way. Someone had obviously stripped the original finish leaving the natural wood looking unnatural for a table model radio. The urge, however, as an out-of-town visitor curious to see what an antique store in Flagstaff would be asking for such a set was all that drew me in for a closer look. I was ready to look for the price - and so informed, walk away - but there written on one of the yellow green stick-on labels were the words "Made in Phoenix". That notation demanded a second look.

This article previously appeared in the Fall 1988 issue of the Arizona Antique Radio Club News.

The radio was a later model and not a type I normally collect. After a second look, but still with little enthusiasm, I decided I should pay the price requested but consider the purchase as one of my poorer decisions in collecting radios. Now, after studying the set a bit further and, admittedly, from only a few observations and a small amount of information, I'm convinced the set has a historical uniqueness all of its own. I am pleased now I made a decision to take a chance on the set.

The radio is a Westcraft, Model U-600, made in Phoenix. The slide rule dial, as can be seen in the photograph, has an illustration of a saguaro cactus centered behind the words Westcraft. The dial consists of a piece of off-white paper with brown printing, attached to a metal backing, with a red pointer.



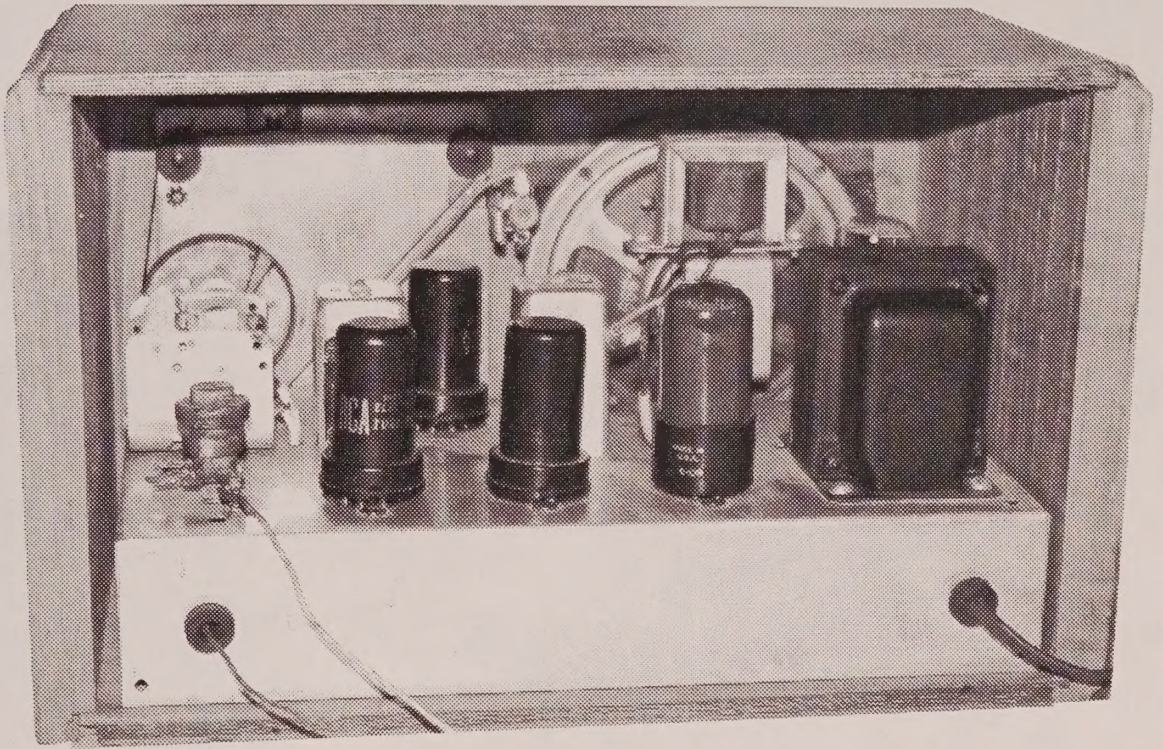
On the bottom of the wooden case, is pasted a schematic as shown below. It is dated 3-7-1946, and as a product of Westcraft, Phoenix, Ariz. The model is given as U-600.

It appears that the hardware and electronic parts are largely off the shelf items of the time, including the use of some tubes produced with military numbers (I'm assuming these are the tubes originally installed). A 6557 tube has been substituted for a 6SK7, and this also may have been done at the time of the building of the set.

It may very well be that this is the one and only Westcraft radio ever built. Certainly the case does not have the craftsmanship expected of a factory production model and would seem to be more on the order of a prototype for a proposed commercial venture. The use of large brass rivets

for fastening the tube sockets to the chassis would seem to be more an expediency in building a first prototype than indicative of an assembly line practice. More significantly, the serial number, as rubber stamped on the paper schematic on the bottom, is 0601. Since it was, and is, a rather common practice to incorporate the model number into serial numbers on commercial products, it would seem safe to assume this was the first set made of the U-600 series.

For those of us who remember 1946, we recall that the industrial changeover from wartime production to civilian goods was taking place at this time. The peacetime minded public was eager to buy products which were still in short supply. Civilian radios had not been in production -at least in any quantity, and it is easy



The rear of the radio shows a typical layout for 1946.

Mfg. Co.

General Electronics Industries is listed in the January and June 1947 editions of the telephone directory, but does not appear in the 1948 editions. Kenneth R. McKee is listed as a resident of 1423 E. Fillmore in the 1947-48 city directory, but never appears in the telephone directories as having a telephone (I did not have time when researching for this information, to see if Kencoff or Thomas were listed in telephone directories).

General Electronics Industries appears to have also existed for only a short time following Westcraft. There is no evidence uncovered so far, that McKee ever started another electronics business in Phoenix.

Mary, from whom the set was purchased at the Stone Cottage Antiques in Flagstaff, said she bought the radio

at a flea market in Flagstaff in the fall of 1971. The radio was painted brown. She had no other information, nor suggestions as to who might be contacted.

It is hoped that this report to the members of A.A.R.C., will lead eventually to further information on the radio and the people of Westgate Manufacturing Company. If anyone has an idea of someone to contact, or a place to look for further information, contact the editor. 🗑️

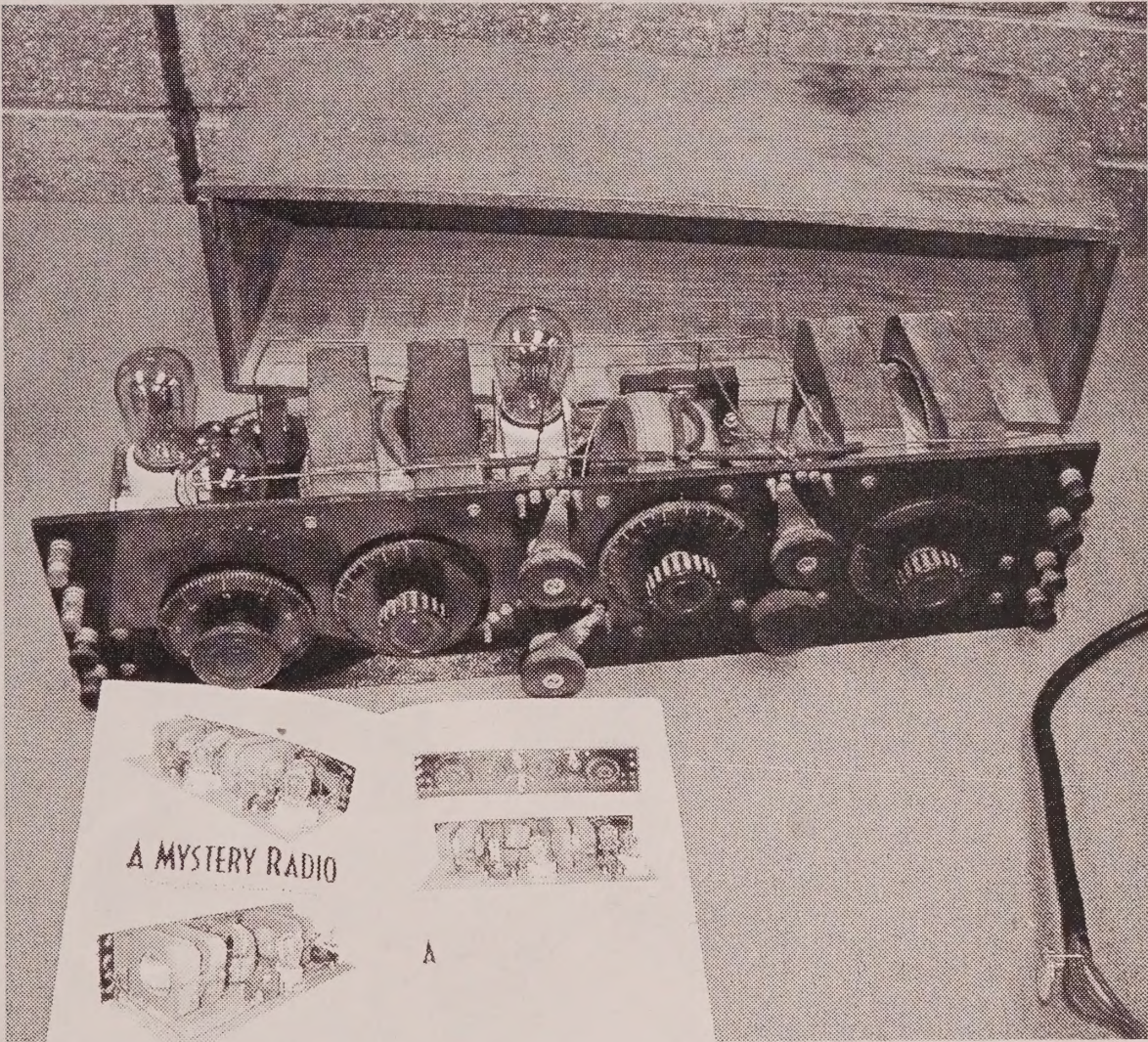
2004 Radio Roundup 1921, '31, '41 AND '51 RADIOS

February 21, 2004 at the Los Olivos Senior Center, Phoenix



Winner of the Best 1921 Radio award was Maury Sievers' Quaker Oats crystal set.

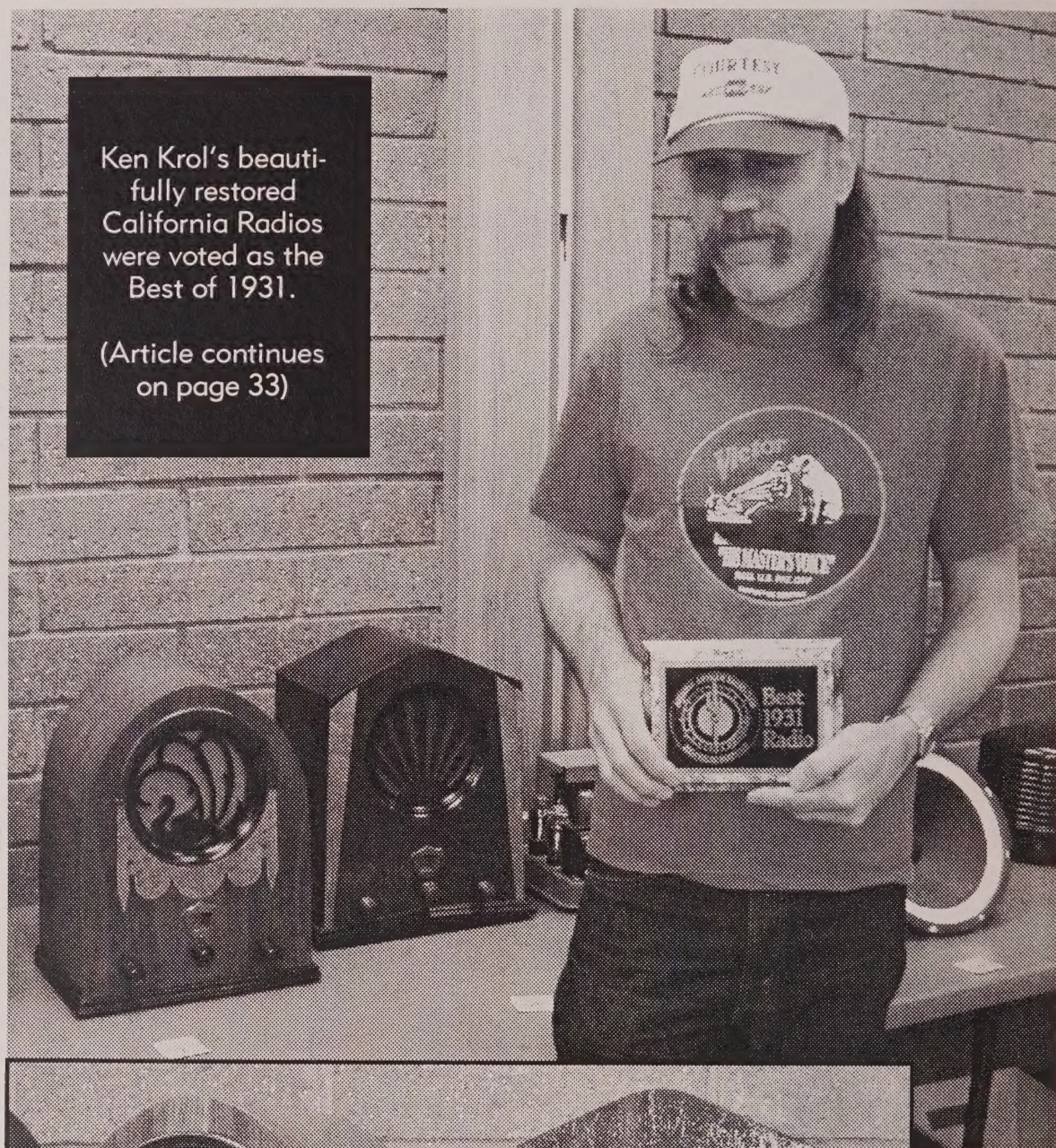




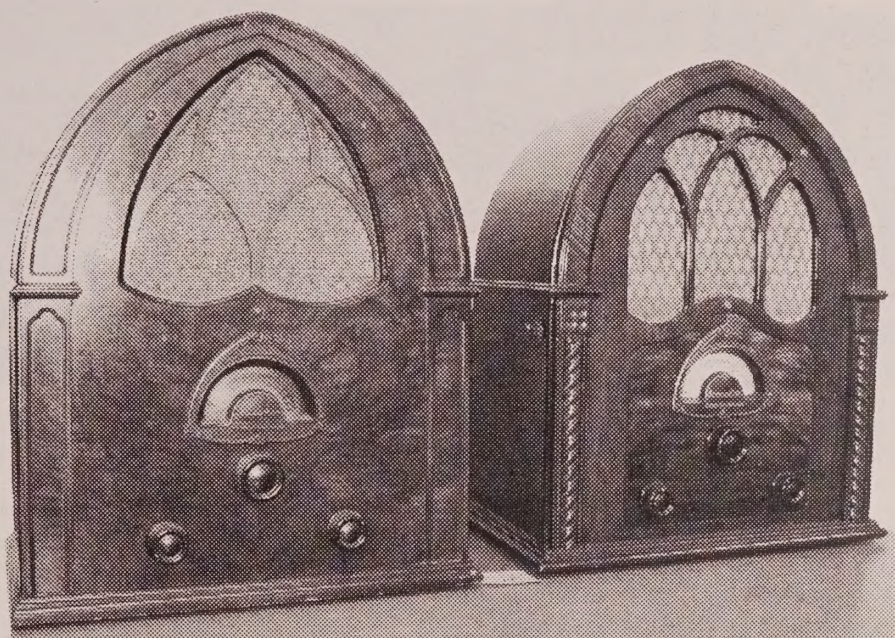
A 1921 homebrew tube set (above, collection of Bill Lettow) and another more elaborate, crystal set were also on display.

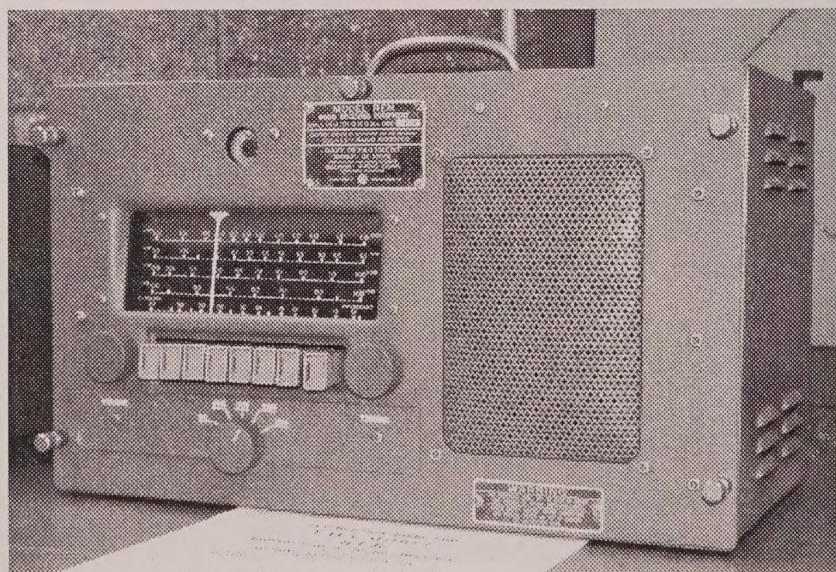
Ken Krol's beautifully restored California Radios were voted as the Best of 1931.

(Article continues on page 33)

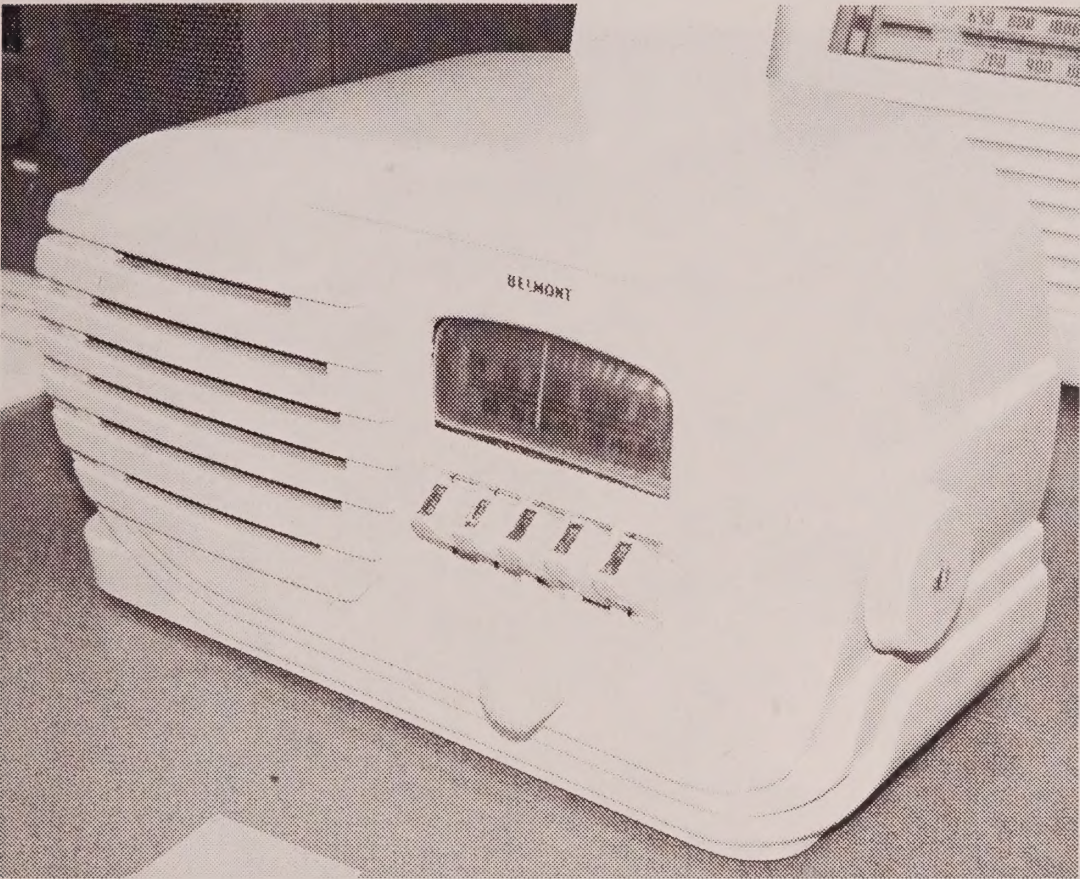


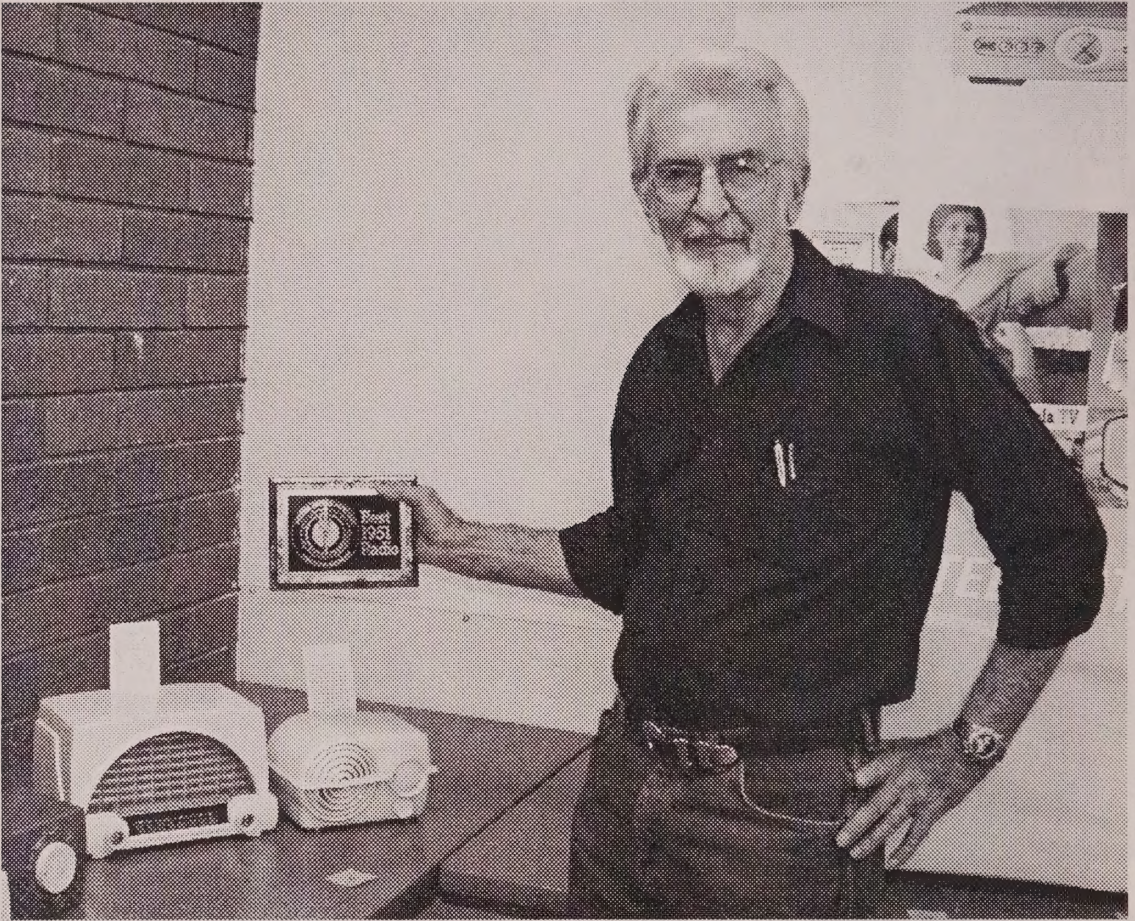
Cathedrals were the thing in 1931 and these are fine examples. At left, Atwater-Kents. Below, a Tom Thumb (Automatic Radio) medley.





Con Morton's
Zenith bakelite was
voted the Best of
this group of 1941
Radios.







Upper left, Carl Robert's Crosley was the Best of 1951; lower left, Mike Brown charmed us and then won Best Story. On this page, the Best of Show Radio, Clyde Watson's 1931 E.H. Scott Allwave 12 Two-Dial.





MEMBERS OF THE ARIZONA ANTIQUE RADIO CLUB 2002~2004*

HONORARY LIFE MEMBERS

W.E. ADAMS
FRANK FALKNER
GEORGE HUETHER
P.A. KINZIE
LESTER RAYNER
ROBERT VERNON

CHARLES BRELSFORD
GEORGE H. FATHAUER
HARRY HYDER
FORREST PEARCE
MAURY SIEVERS
CLYDE WATSON

* This list combines all membership rosters for 2002, 2003 or 2004. It does not show the current dues or renewal status of any members. Membership dues are due at the beginning of the calendar year.

Underlined names are 1983 Charter Members.

- Anderson, Charles, 6340 N 16th St #74, Phoenix, AZ, 85016, 602-274-8617
- Anderson, Walter, 7416 Spring Village Dr., Apt T-09, Springfield, VA, 22150, 703-560-6227, knwa@erols.com
- Aschenbach, James, KB7FJX, 1960 E 32nd St #801, Yuma, AZ, 85365, 928-920-8661, janera@msn.com
- Bakinowski, Bob, 1524 S St Tropaz Pl, Tucson, AZ, 85713, 520-624-8029, bobnpaulasplace@yahoo.com
- Bang, Victor, 7520 S Rural Rd #A-3, Tempe, AZ, 85283, 480-491-1811, Bcarm47@aol.com
- Barter, Richard, N5SGW, N5SGU, 2705 Gene Littler, El Paso, TX, 79936, 915-593-0148, B.barter@worldnet.att.net
- Barton, Rick, 16635 N Cave Creek Rd #123, Phoenix, AZ, 85032, 602-493-3380, desert_moon_dxr@postmark.net
- Becker, Bill, 3625 E Ray Rd. #2028, Phoenix, AZ, 85044, 480-706-2095
- Bergan, Martin, 2011 E Flynn Ln, Phoenix, AZ, 85016, 602-274-5895, Radiomart35@aol.com
- Berky, Julius, 3202 E Cloudcrest Ln, Tucson, AZ, 85739, 520-825-0736, jlberky@yahoo.com
- Beyer, Donald, 6702 E Hubbell St, Scottsdale, AZ, 85257, 480-945-7819
- Blansette, Brad, 4120 N. 78th St. #211, Scottsdale, AZ, 85251, 480-343-2300, bradb@lifegrid.com
- Boykin, Jim, 4518 W. Estrella Dr., Laveen, AZ, 85339, 602-237-2231
- Boza, Tom, NE7X, 13609 N 49th Pl, Scottsdale, AZ, 85254, 480-554-4387, Ne7x@aol.com
- Brendecke, Walter, 3028 N 47th Pl, Phoenix, AZ, 85018, 602-840-0106, Sirwalt@cox.net
- Bretz, Mark, N7TPJ, 6879 E Kings Av, Scottsdale, AZ, 85254, 480-991-7571
- Brown, Francis, 4001 E Blacklidge #17, Tucson, AZ, 85712, 520-325-6826
- Brown, Mike, 1230 N Mesa Dr #268, Mesa, AZ, 85201, 480-668-7541, Mikebrown@antiqueradios.zzn.com
- Brown, Wayne, 99 N. Cooper Rd. #121, Chandler, AZ, 85225, 480-899-9583, smellum@cox.net

X-L PRODUCTS

*Their Use in All the Latest
and Best Circuits as Endorsed
by The Leading Radio Authorities*

The X-L Vario Denser is designed primarily for use where accurate values or adjustments are required.

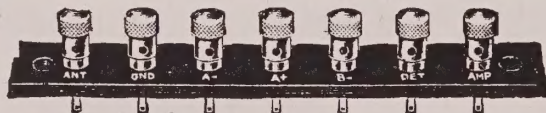
Genuine Bakelite casing, all metal parts phosphor bronze nickel plated and the best imported India mica obtainable make up the construction. Dust and moisture proof casing, extreme micrometer advance, broad and positive capacity range adjustment and exceptional accessibility in close quarters are the exclusive features that make critical adjustments a pleasure with X-L.

X-L Vario Densers are recommended and used in the Browning-Drake Circuit, Roberts' Two Tube, Albert G. Craig's Radio Frequency Receiver, McMurdo Silvers' Knockout, Hugo Gernsbacks' Interflex, Neutrodyne and all radio frequency circuits. For positive grid bias, filter and intermediate frequency tuning in Super-Heterodyne and any circuit where accurate condenser values are necessary.

The X-L "Push Post," a binding post that really does excel in looks, action, service and convenience. No screwing—no shearing of wires—no jarring loose. Large convenient hole. Easy to enter wires. Furnished attractively plated with the following designations.

Antenna	C Battery —	B Battery 135 +
Ground	C Battery — 22	B Battery 180 +
Loop	C Battery — 45	B + Detector
Speaker +	B Battery +	B + Amplifier
Speaker —	B Battery —	Intermediate
Phones	B Battery 22 +	Short Antenna
A Battery +	B Battery 45 +	Long Antenna
A Battery —	B Battery 67 +	Input
C Battery +	B Battery 90 +	A + B —
		A — C +

Boxed in sets for all popular circuits.



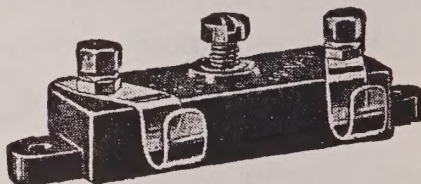
Handsome polished panel with seven mounted push posts and the following attractive white engravings, Aerial, Ground, A —, A +, B —, B + Det. and B + Amp. Complete with soldering lugs, raising bushings, screws for mounting, etc. Price Each \$1.50.



**MODEL "N"
VARIO-DENSER**

Has variable capacity, adjustable from 1.8 to 20 micro-microfarads, which is .0000018 to .00002 microfarads.

Price Each \$1.00



**MODEL "G"
VARIO-DENSER**

Made in three variable capacity ranges.

Model G-1—.00002 to .0001 MFD.

Model G-5—.0001 to .0005 MFD.

Model G-10—.0003 to .001 MFD.

Complete with grid leak clips.

Price Each \$1.50

"X-L PUSH POST"



BAKELITE
INSULATED OR
ALL METAL



Price Each 15 cents

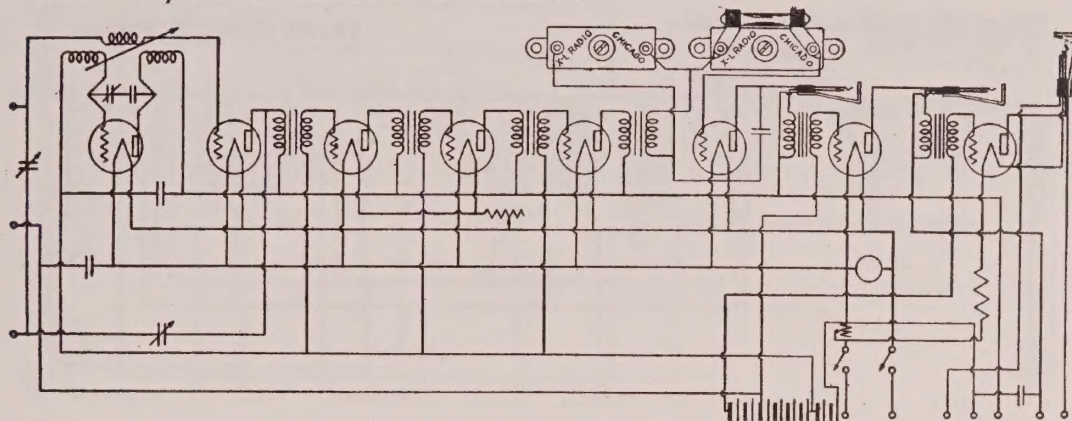
The X-L Products Brochure, seen on this and the following pages comes from the collection of Richard Gentry of Phoenix. The booklet provides a variety of circuits utilizing the X-L "Vario-Denser".

Burchell, Jim, 465 S. Kenyon Dr, Tucson, AZ, 85710, 520-790-9331,
jwburchell@yahoo.com

Burkett, Bill, P O Box 2488, Sun City, AZ, 85372, 623-974-4535, Bill.
burkett@cox.net

Cain, David, 13940 W. Meeker Blvd., Ste 115-122, Sun City West, AZ, 85375,
623-910-4191, dcain@pngusa.net

BESTS 45,000 CYCLE SUPER-HETERODYNE



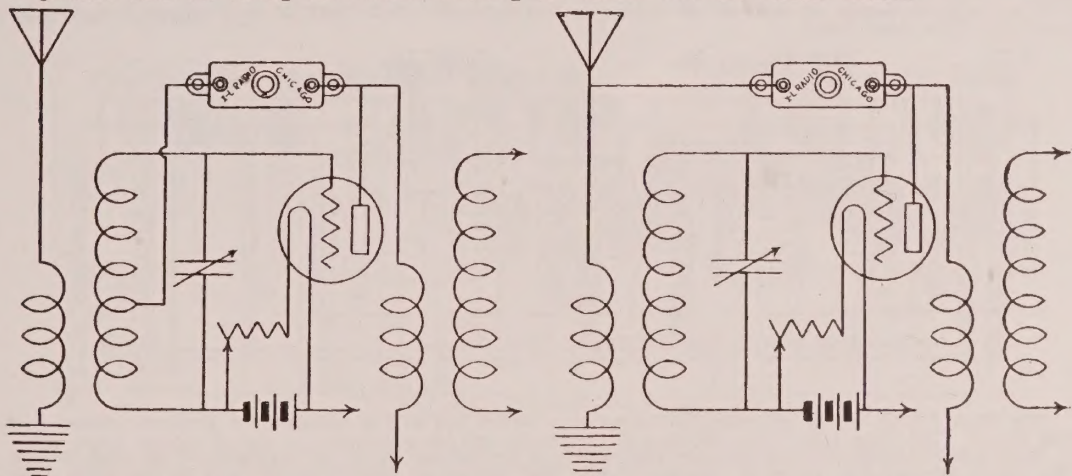
"Just to advise you of my experience with your Vario Denser in my Remler Super-Heterodyne. After replacing the ordinary fixed condenser that tunes the output transformer, with your model G-5, I am glad to report that the volume of the set has increased one hundred per cent. The proper condenser value for tuning this transformer certainly is an important item in this circuit."

GEORGE V. HARPER, San Francisco, Calif.

DIRECTIONS.—Both of the Vario Densers shown in this circuit are the model G-5.

To adjust the Vario Denser which is shown across the secondary of the last intermediate frequency transformer, tune in a distant station as clear as possible and then cut down on the volume control until it is barely audible. Now adjust the Vario Denser until the signal is brought up to the loudest point.

To adjust the Vario Denser used as a grid bias, use the same process as described above for the intermediate frequency condenser, being sure in both cases that the station is tuned in as clear as possible with the tuning units before reducing the volume with the volume control.



TWO METHODS OF OSCILLATION CONTROL IN RADIO FREQUENCY CIRCUITS

Rice Capacitive Feed Back

This is an exceedingly effective yet simple system whereby very close control of the regeneration is had so that the circuit can be held closely to a condition of maximum sensitivity.

The Vario Denser used for this purpose is a model G-1.

Capacitive Feed Back to Aerial

This method is about the same thing as the Rice method in general principles, although it is not quite as critical as the former.

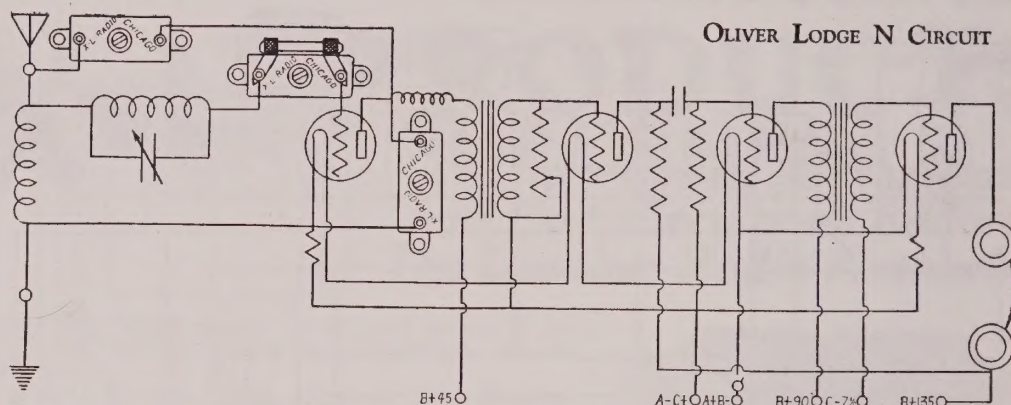
The Vario Denser for use with this method is generally the model G-1, although in many cases the model N will prove of sufficient capacity.

Capelle, Elwood, W0PAP, 19401 N 7th St # 254, Phoenix, AZ, 85024, 623-516-9106

Carson, William, WB7SOU, 1665 Abert Ct, Prescott, AZ, 86303, 928-771-8569

Cavanaugh, Mike, 9016 E. Holmes St., Tucson, AZ, 85710, 520-290-0522, popeyemike@att.net

Chaney, Paul, 12320 Tigerseye Dr, Sun City West, AZ, 85375, 975-2093, w6rp@msn.com



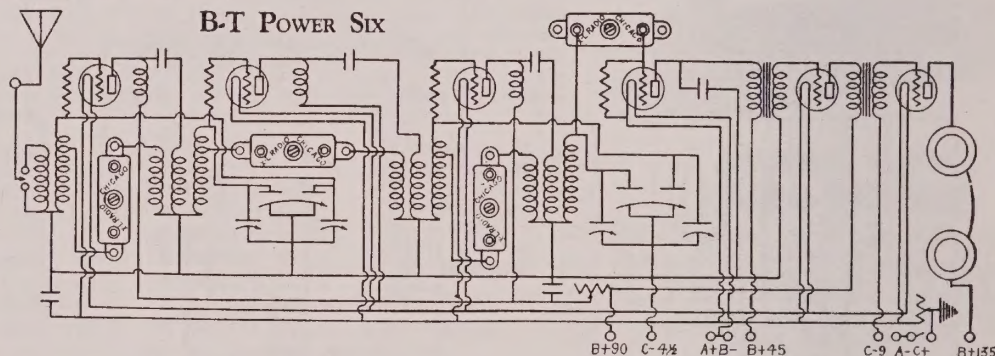
This is an exceptionally simple and cheap receiver to construct for local reception and the single dial control is a decided advantage.

The Vario Denser in the detector grid circuit is a model G-5 which is adjusted for greatest volume on a weak signal. The two others are the model G-10. In describing the adjustment of the latter, we refer to the one at the aerial end of the antenna coil as number 1 and the one at the ground end as number 2.

Set Vario Denser number one to its maximum capacity, which is, when the screw is nearly all the way in. Set Vario Denser number 2 to its minimum capacity or when the screw is nearly out. Now when the set is turned on, the tube should oscillate strongly. This condition can be recognized by moving the tuning condenser, from maximum setting, down the scale until a whistle is heard.

Now turn down the adjustment screw on Vario Denser number 2 until the oscillation just stops. Then turn the tuning condenser down the scale. If the circuit comes into oscillation again on the lower waves, reduce the capacity of Vario Denser number 1 until the oscillation stops. Now go back to the higher waves and if it still oscillates, increase the capacity of Vario Denser number 2. Repeat this process until the circuit is maintained below the oscillation point over the entire wave band.

Constructional details of this circuit can be had in pamphlet form from us or Precision Coil Co., 209 Center St., New York City.



The Vario Denser in the detector grid circuit is a model G-5 and is adjusted for greatest volume on a weak signal. The three other Vario Densers in the circuit are the model N.

To balance the radio frequency stages, first tune in a station and adjust the trimmers for greatest volume. Then adjust the volume control to greatest volume and disconnect either filament lead to the third radio frequency socket. The signal should still be audible. Then turn the screw of the Vario Denser next to the socket, until the signal is weak or disappears. Now retune the right hand dial until the signal again is loudest, using also the trimming condenser. Again adjust the Vario Denser until the signal is weak or inaudible.

Replace the tube and carefully retune the set. Repeat the balancing procedure with the second and first radio frequency tubes in order named. In adjusting the first and second tubes, detune the third and detector until the volume is fairly weak. This will make the point more exact.

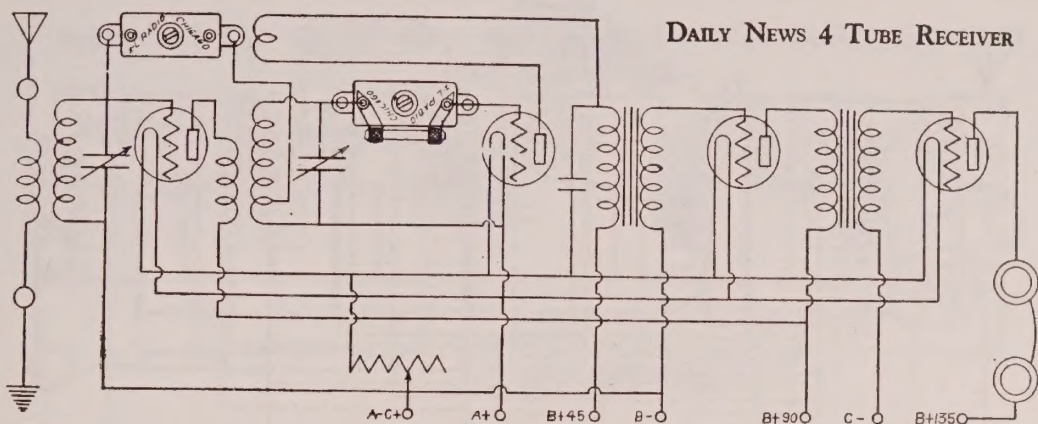
Constructional details of this receiver were published in the March, 1927 issue of Radio Listeners Guide and Call Book.

Chubinsky, Mark, 1132 E Weldon, Phoenix, AZ, 85014, 602-274-4354,
GMBC@juno.com

Cirillo, Richard, 1953 E Huntington Dr, Tempe, AZ, 85282, 480-839-
0127

Citron, Jon, 3324 E Coconino St, Phoenix, AZ, 85044, 480-966-2929,
citronj@qwest.net

Clifford, Jerry, 7615 E Ann Way, Scottsdale, AZ, 85260, 480-998-1137



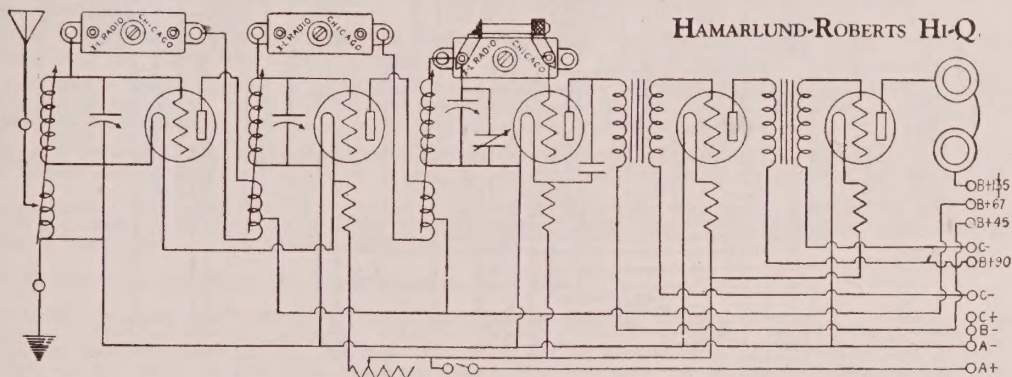
The Vario Denser in the detector grid circuit is a G-5 and is adjusted for greatest volume on a weak signal. The other Vario Denser in the circuit is the model N for neutralization.

To neutralize the receiver, turn the volume control knob all the way to the left (this is, when the rotary coil is at right angles to the stationary coil) and the movable winding of the antenna coil should be pushed all the way in with the hand. If the condensers are set at 90 degrees on the dials, plunks should be heard as they are rotated, or possibly squeals.

It will be found that the screw in the Vario Denser can be turned to a point where the plunks or squeals will disappear. When this condition has been obtained, the receiver is neutralized and the Vario Denser may be ignored.

If this condition of neutralization cannot be obtained, the number of turns on the rotor coil of the right hand radio frequency transformer should be reduced to five or six turns. If this is insufficient to eliminate the squeals when the movable coil is at right angles with the stationary coil, a .002 MFD fixed condenser should be connected from the plus 90 binding post to the minus A binding post.

Constructional details of this receiver may be had in booklet form from us or Aero Products, Inc., 1772 Wilson Ave., Chicago, Ill.



The Vario Denser in the detector grid circuit is a model G-5 which is adjusted for greatest volume on a weak signal. The two other Vario Densers shown in the circuit are the model N and a model N may also be used as the trimmer shown across the rotor and stator of the third tuning condenser.

To balance the receiver, tune in a station at about 20 or 30 on the dials, to its loudest point. Then adjust the volume control until the signal is barely audible. Now adjust the trimming condenser to the point where the signal is loudest. Retune the dials and make another adjustment of the trimming condenser. This, then, needs no further attention.

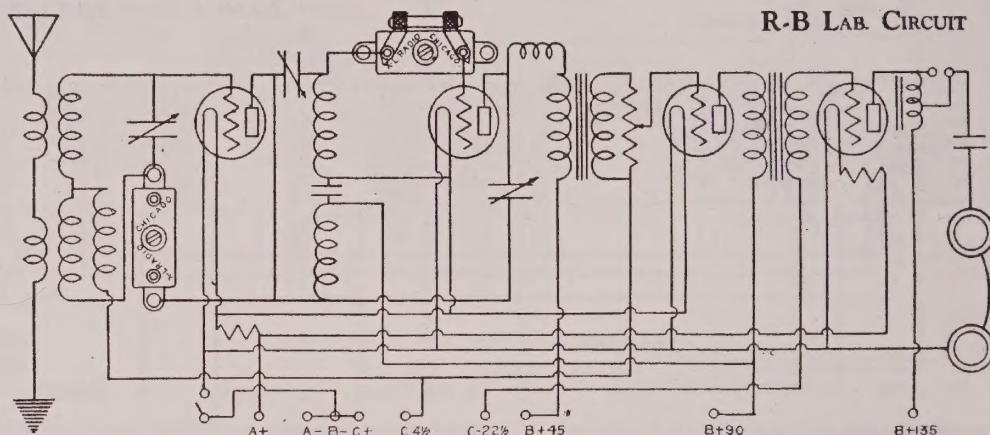
Now turn up the volume control to the loudest volume and disconnect the plus filament supply from the first socket, leaving the tube in place. The signal will now be considerably reduced and it may be advisable to substitute the head phones for the loudspeaker. Now gradually turn down the screw of the Vario Denser until the signal is at its minimum or disappears entirely. Now replace the filament wire on the socket and proceed in a like manner with the second tube.

Coder, David, 2453 S. Acanthus , Mesa, AZ, 85208, 480-984-5652,
azcoder@netzero.net

Cook, Branson, 108 Spruce Ln, Mount Holly, NJ, 08060, 609-267-1399

Copleman, Randy, 3971 E. San Simeon Dr., Tucson, AZ, 85718, 520-794-8921, Rwcopleman@raytheon.com

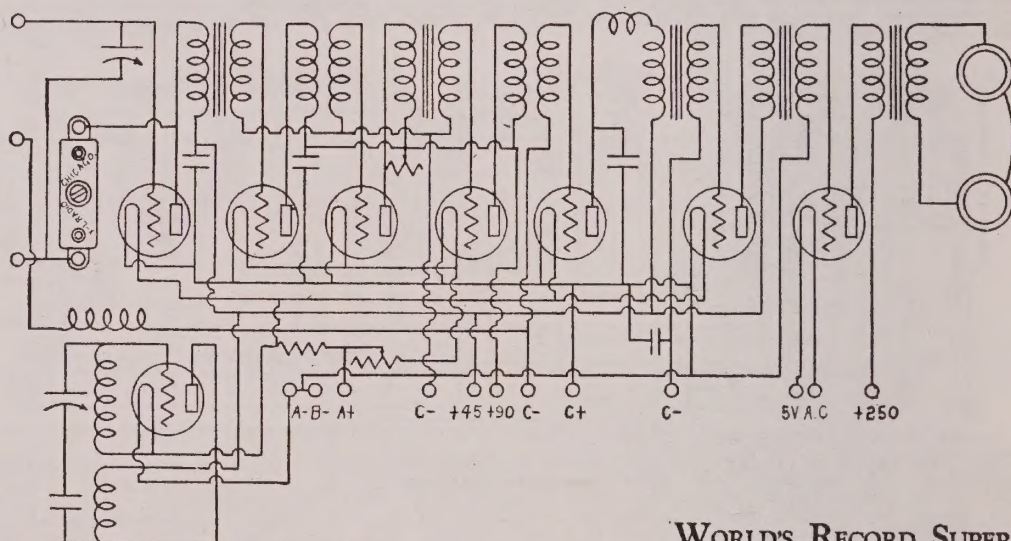
Craft, Dennis, 10513 E Clinton St, Scottsdale, AZ, 85259, 480-510-3054,
dcraft@qwest.net



The Vario Denser in the detector grid circuit is a model G-5 which is adjusted for greatest volume on a weak signal. The other Vario Denser is the model N used for neutralization of the radio frequency stage.

To adjust the neutralizing Vario Denser, turn the regeneration condenser so its movable plates are completely meshed with the stationary plates. Then set the right hand dial at an approximate setting for a station that is desired to receive and slowly turn the knob of the detector condenser, swinging it a few degrees above and below the number on the other condenser. If the station is broadcasting, a regeneration squeal will be heard in the phones or loudspeaker. Back off the regeneration condenser setting to diminish the squeal. Then slowly rotate the antenna tuning condenser. If the squeal changes in pitch, the Vario Denser should be adjusted until there is no such variation of the squeal pitch. The set is then properly neutralized.

Constructional details of this receiver were published in the November, 1926 issue of Radio Broadcast.



This receiver has an enviable reputation in the Super-Heterodyne field.

The Vario Denser shown in this circuit is a model N used to control the regeneration in the loop circuit. It should be set for a value that will give regeneration, but not oscillation, at a point about midway between the upper and lower ranges of the broadcast channels, say about 300 to 333 meters. Its adjustment is then complete and need not be touched again.

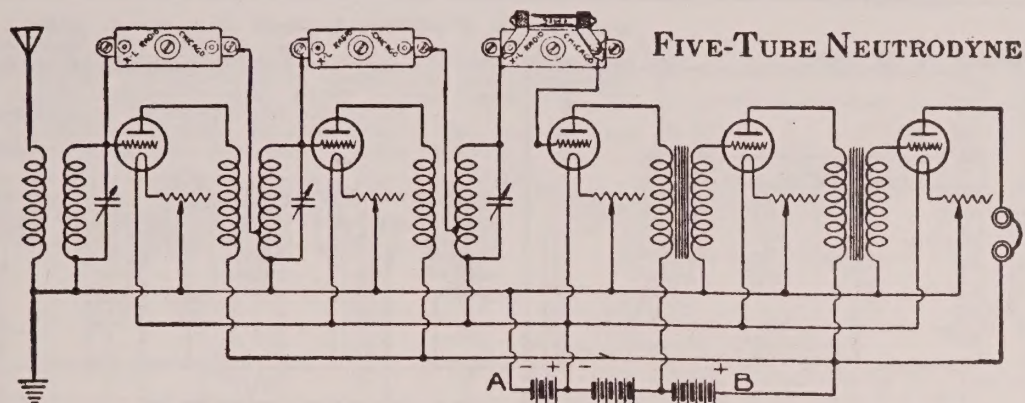
Constructional details of this receiver were published in the March, 1927 issue of Radio Age.

Culberson, Edward, 9024 N. Clover Way, Tucson, AZ, 85743, 520-744-2924,
cusnretired@earthlink.net

Davies, Bob, K7BHM, 1623 N. Los Altos Court, Chandler, AZ, 85224, 480-
839-3728, K7bhm@arrl.net

Deane, Roger, KD6CNY, 31211 N. 77th Way, Scottsdale, AZ, 85262, 480-
209-1700, rogdeane@cox.net

DeFir, Charles, W7NSQ, 4024 E Enrose Av, Mesa, AZ, 85205, 480-610-8495,
Charliedefir@cableaz.com



"The ease with which I have been able to balance Neutrodyne sets with your Varlo Denser prompts me to write a letter of appreciation for this simple little article, the performance of which will, no doubt, surprise the most experienced or skeptical."

W. E. BOSTWICK, Chicago, Ill.

DIRECTIONS.—The two Varlo Densers used in the radio frequency stages are the type "N," the one used for grid bias is type "G-5."

To adjust the grid condenser tune in a station loud and clear. Now cut down the signal with the volume control (usually the radio frequency rheostat) until the signal is barely audible. Then adjust Varlo Denser until the signal increases in volume as much as possible. A further and more critical adjustment can then be made on a weak distant station.

To neutralize the set, put phone plug in the detector jack and turn filament rheostats on to the point just before a sizzling or frying noise is heard.

Now tune in a good, strong station to its loudest point on all three neutroformer dials and after removing the first radio frequency tube from its socket, retune all three dials until the signal is at its loudest point.

Place a piece of paper over one of the filament prongs of the tube and return to its socket. It will be found that the signal can still be heard.

Now take a screw driver, or preferably a sharpened stick and starting from the point of minimum capacitance of the Varlo Denser, or when the adjusting screw is almost out, slowly turn adjusting screw in clockwise manner, until the signal is at a minimum or entirely disappears.

It will be found that the neutralizing point is very evident and not critical in adjustment with the Varlo Denser and if the point is passed it can readily be found again by backing up on the screw.

Now remove the paper from the filament prong of the first tube and again returning it to its socket, proceed identically with the second radio frequency tube. After these adjustments are made the neutralization is permanent and need never be touched again.

J. E. Anderson, prominent New York engineer, says also:

"Almost invariably the value of the condenser used for blocking the grid current in a detector is .00025 microfarad. The use of this particular value is largely a matter of habit. The optimum value to use depends on many factors, namely, the type of tube used for detector and on the manner in which it is operated, on the value of grid leak connected across the condenser, on the natural leakage from grid to filament through the insulation of the grid or the condenser itself, and on intensity of the signal voltage. If the insulation of grid is poor or if a large grid leak (low resistance but large leakage) is used a small condenser works best. Similarly if the signal is weak a small condenser works best, one very much smaller than the .00025 MFD. ordinarily used. Conversely, if the insulation of the grid is very good, or if small leakage (high resistance) is used, the condenser may be larger; and if the signal is very strong it is better to use a larger condenser. The best value to use also depends on the ratio of the carrier frequency to the average carried frequently. Ordinarily the value of the grid condenser may be reduced to .000125 or even .00005 MFD. with good results. And the smaller it is, other things remaining constant, the more sensitive will the detector be. The limit of reduction, for a given signal intensity and given grid leakage, will be when the grid blocks."

Install an X-L VARIO DENSER in your detector grid circuit and enjoy maximum sensitivity.

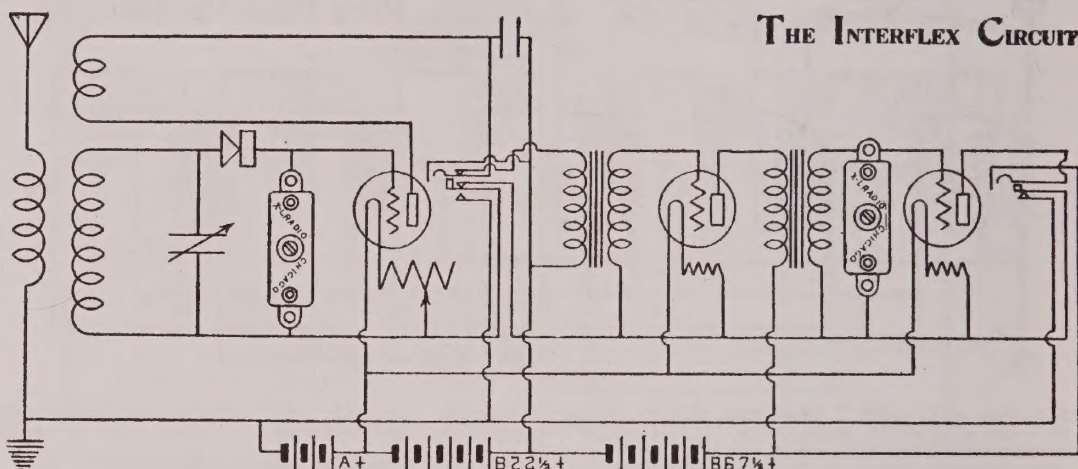
Dennis, Paul, P O Box 5186, Tucson, AZ, 85703, 520-743-7755,
pdennis@northlink.com

DeSimone, Dino, 738 W Nido Circle, Mesa, AZ, 85210, 480-497-5811

Dodson, Van, 917 W. Cheyenne Dr, Chandler, AZ, 85225, 480-732-0682,
vaninchandler@aol.com

Doles, Michael, 27632 N Black Canyon Hwy, Phoenix, AZ, 85085, 623-582-4122

THE INTERFLEX CIRCUIT

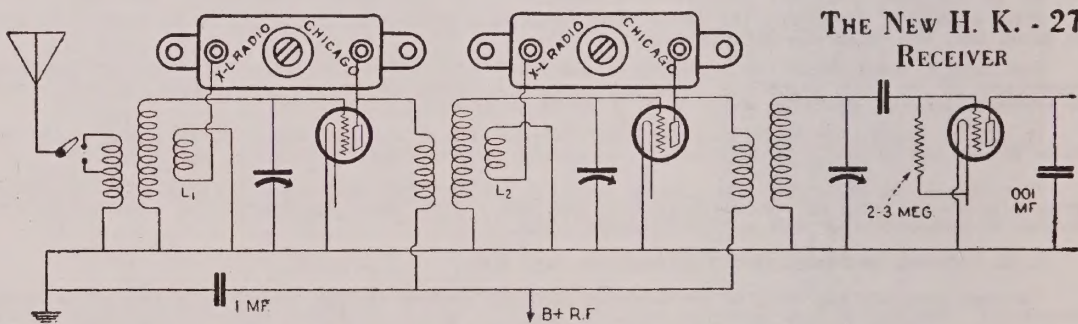


"Let me thank you for the X-L Vario Denser. This little device is, in itself, a neat bit of workmanship and is certainly an important unit in Mr. Gernsback's Regenerative Interflex."

CARL LAURIER, Park Ridge, N. J.

DIRECTIONS.—The Vario Denser used in this circuit is a model N.

Screw the tickler nearly all the way down and begin tuning with the variable condenser. If the set does not oscillate, that is, if it does not squeal move the tickler up and down until the set squeals loudly. Then screw the tickler down a trifle. Now begin tuning for a low wave length station. You will find in most cases that the set squeals. Do not touch the tickler at all, but adjust the Vario Denser. Keep screwing down slowly until the squeals stop. Carefully adjust the rheostat to a point of maximum volume without a hissing sound. Now, by a slight readjustment of the Vario Denser and tickler, maximum efficiency may be had from the set.

THE NEW H. K. - 27
RECEIVER

This new circuit is creating a vast amount of interest because of its reproduction of music with absolute fidelity, entirely free from distortion and with a mellow, full rounded tone. Speech is re-created in pure, natural tones.

DIRECTIONS.—The two Vario Densers shown in the radio frequency circuits are the model G-1.

To neutralize the set, turn the antenna switch to the right and turn the rheostat (volume control) to its maximum position. Take the second radio frequency tube out of its socket, wrap a little paper around one of the filament prongs and replace the tube in its socket so that it does not light. Then tune in some local station and adjust the capacity of the second Vario Denser with a screw driver. It will be noticed that at a certain capacity the signal is inaudible. Set the Vario Denser at this point.

Perform the same operation described above with the first tube, adjusting the capacity of the first Vario Denser until the signal is inaudible or at a minimum audibility. Remove the paper from the filament prong and replace the first tube in its socket.

Complete details and constructional data of this circuit may be had by forwarding twenty-five cents to the K. H. Radio Laboratories, Inc., 124 Cypress Ave., New York City.

Donaghu, D. W., 1033 Sheriffs Posse Tr., Prescott, AZ, 86303, 928-717-4973,
M-K-S@worldnet.att.net

Enderson, Tom, 3710 S Goldfield Rd #1053, Apache Jctn, AZ, 85219, 602-
671-1853, tendb@juno.com

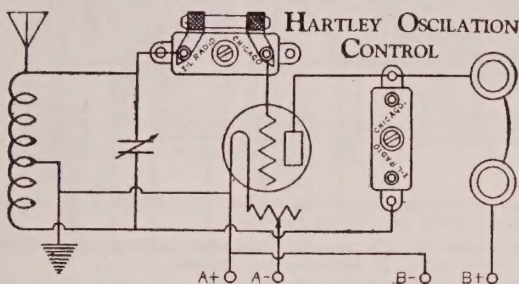
Evans, Eric, 421 S. Williams Place, Chandler, AZ, 85225, 480-814-8327,
ericwevans@earthlink.net

Fathauer, George A, 13051 S 35th St, Phoenix, AZ, 85044, 480-893-6689,
snrnpub@aol.com

Addition of this radio frequency amplifier is the selectivity solution for many receivers.

The Vario Denser shown in this circuit is a model N, used for neutralization and prevention of broadcasting oscillation howls. It may be adjusted by either of the methods described for the Neutrodyne or Browning-Drake receivers.

Constructional details and application of the amplifier were published in the June, 1926 issue of Radio Broadcast.



This novel detector circuit, for which Robert P. Goodwin, prominent New York Radio engineer, is responsible, may be added to every type of receiver, always obtaining a great gain of amplification and selectivity. It is both cheaply and easily constructed.

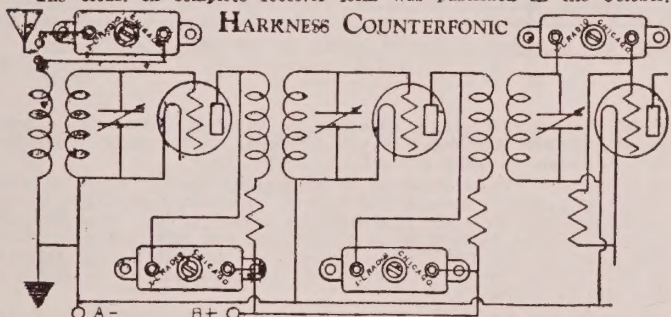
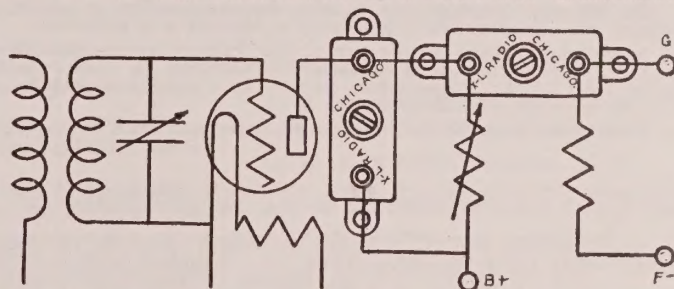
In adapting this system, it is merely necessary to disconnect the grid leak and condenser and change the grid return to A negative, then add the Aperiodic Detector system (net-work of resistance and Vario Densers) and one additional tube. This will give an additional stage of radio frequency without adding additional controls. Immediately after adapting this system, it will be noticed that the signal has been amplified some two to four times greater than was previously obtained.

The Vario Densers shown in this circuit are the model G-5, the variable resistance is a 200,000 ohm and the grid leak is a 2 megohm.

To adjust the circuit, turn the variable resistance completely to the right, being positive that the Vario Densers are adjusted for maximum capacity. This is accomplished by turning the screws all the way to the right. Then tune in a strong signal and should distortions be present, turn the variable resistance slightly to the right and the Vario Densers slightly to the left.

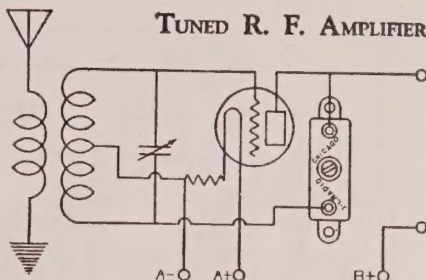
The circuit in complete receiver form was published in the October, 1927 issue of Radio News.

GOODWIN APERIODIC DETECTOR CIRCUIT



ately one quarter turn apiece until the tuning dials can be rotated across the station point without squealing. Full details of this circuit can be had by sending 25 cents to Kenneth Harkness, Inc., 181 Sullivan St., New York City.

TUNED R. F. AMPLIFIER



The Hartley method of oscillation control needs no introduction, it being an old standard.

The Vario Denser in the detector grid circuit is a model G-5 which is adjusted for greatest volume on a weak signal. The other Vario Denser in the circuit is a model G-1 used to control oscillations. A little experimenting with various settings of the adjusting screw will reveal the point at which oscillation will be overcome.

This is, apparently, a new method of controlling self oscillations, devised by Kenneth Harkness who claims perfect control of this bug bear.

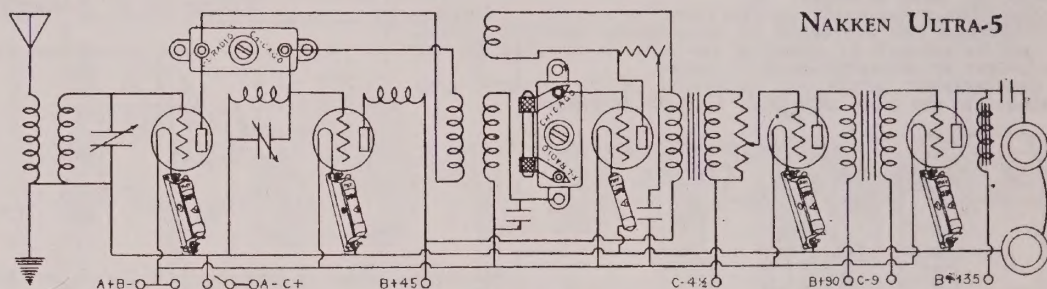
The Vario Denser in the antenna circuit is a model G-1 which is adjusted for best conditions of reception while the receiver is in operation. The Vario Denser in the detector grid circuit is a model G-5. This is adjusted for greatest volume on a weak signal. The two Vario Densers in the radio frequency plate circuits are model G-1. To properly adjust these, tune in a station at about 250 meters and starting from the point of minimum capacitance of the Vario Densers, or when the screws are nearly out, turn the adjusting screws alter-

Fathauer, George H, 1550 Bel Air Drive, Mesa, AZ, 85201, 480-964-6920,
fathauer@cableaz.com

Fischer, Lynn, 1925 E Lynwood St, Mesa, AZ, 85203, 480-833-1118,
lf11175@juno.com

Fisher, Arthur, W7UFP, 708 W Northview Av, Phoenix, AZ, 85021, 602-943-6192

Fisher, Brett, P O Box 788, Pine, AZ, 85541, 928-476-2022



This five tube circuit, which has been referred to as a midget super-heterodyne, is reputed to be as selective as that circuit and as sensitive as a five tube tuned radio frequency receiver.

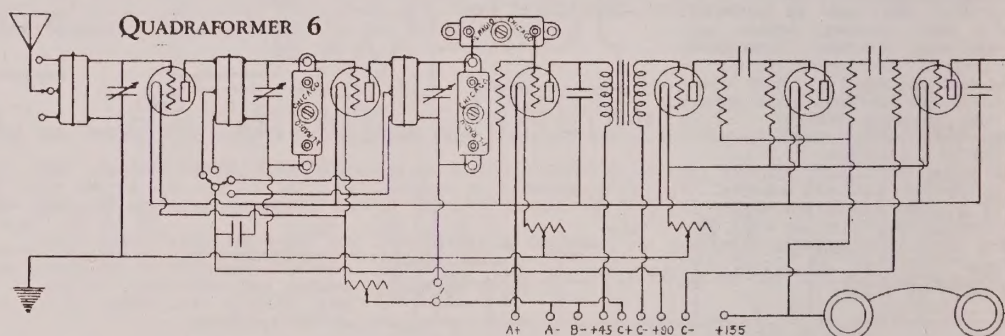
The Vario Denser in the detector grid circuit is a G-5 which is adjusted for maximum volume on a weak signal. The other Vario Denser in the circuit is a model G-10 which is adjusted as follows.

Tune the receiver slowly over the entire wave band. If squeals are encountered at any point, vary the capacity of the Vario Denser slightly by means of a screw driver. This variation affects the wavelength of the coil combination, thus it is impossible for that particular interference to occur again.

In this way is quite easy to find, for any locality, a setting of the Vario Denser where interference between local broadcasters is prevented or reduced to a minimum.

A second advantage of the use of the Vario Denser is that it enables the builder to bring the primary and the secondary of the intermediate transformer in close resonance. In this condition the transfer of energy from primary to secondary will be at a maximum, and the signal will be passed on to the detector with the greatest possible efficiency.

Constructional details of this receiver were published in the March, 1927 issue of Radio News.



The Vario Denser in the detector grid circuit is a G-5 and is adjusted for greatest volume on a weak signal. The two other Vario Densers in the circuit are the model N and are used as trimming condensers to equalize the capacities of the two tuning condensers in gang control.

To balance the set adjust both trimming condensers (Vario Densers) to minimum capacity, which is when the screws are almost all the way out. Tune in a station around 3.0 meters, adjusting both dials to the point of maximum volume. Now, with the volume control knob, decrease the signal to the most pleasing intensity. Adjust the detector and audio rheostats to the position of best operation and then cut the volume until the signal is barely audible. Turn the screw in the Vario Denser across the first interstage Quadraformer in clockwise direction until it is all the way in, then back it off two complete turns. Leave it in that adjustment. Readjust right hand tuning dial to loudest intensity.

Now slowly turn down the adjusting screw of the other trimming condenser (Vairo Denser) until the signal is at its loudest. While making these adjustments of the Vario Densers, keep the volume of the signal low enough so the changes can be readily distinguished.

Constructional details of this receiver can be had in booklet form from Gearhart-Schlueter Radio Corp., 1719 Van Ness Ave., Fresno, Calif.

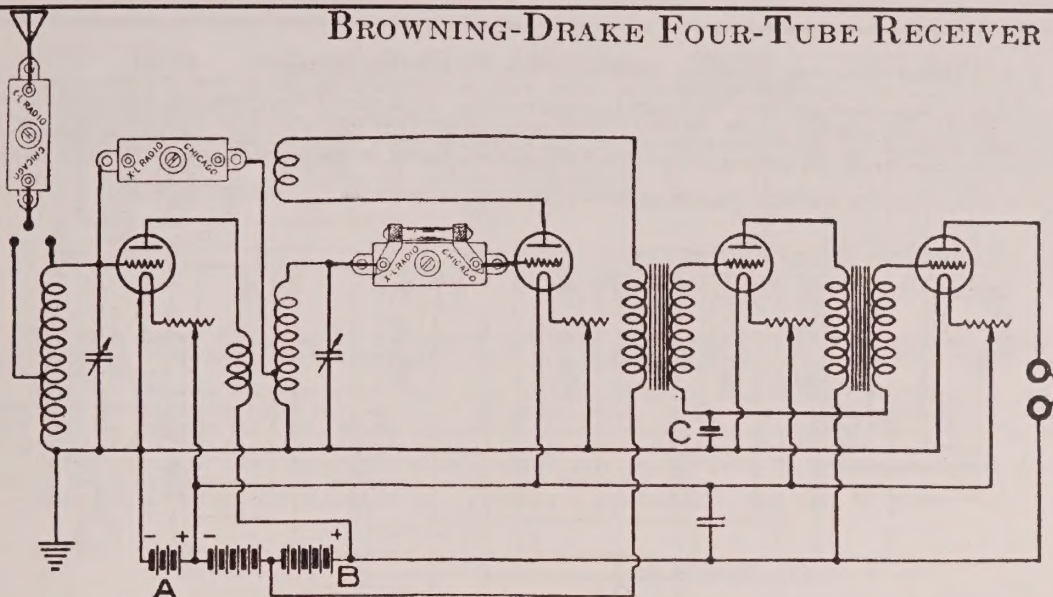
Fleming, Miner, 1337 N. Roadrunner Rd., Apache Jctn, AZ, 85219, 480-982-3036, Wcco@mchsi.com

Flint, Charlie, 1200 E. Torrey Pines Lane, Chandler, AZ, 85249, 480-802-9694

Fox, John, P O Box 340, Overgaard, AZ, 85933, 928-535-5388, Fox4@therim.com

Franklin, David, 2513 E Verde Ln, Phoenix, AZ, 85016, 602-955-8097

BROWNING-DRAKE FOUR-TUBE RECEIVER



"The model N Vario Denser you sent me worked so good that I am ordering a model G-5 for use in the detector grid circuit of my Browning-Drake set."

A. H. DeFOREST, Kingston, N. Y.

"I have found your Vario Densers so good that I am sending a check for \$1.50 for one model G-10 to use across the first stage of my Browning-Drake set."

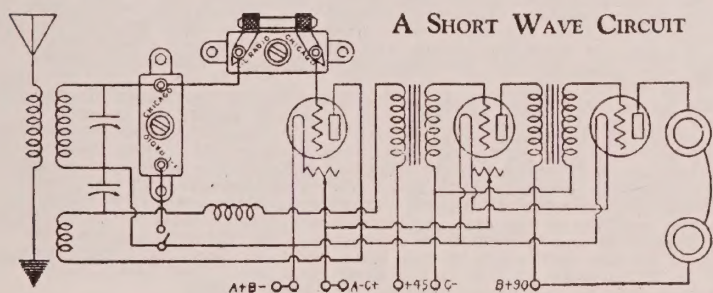
A. H. DeFOREST, Kingston, N. Y.

DIRECTIONS.—The Vario Denser used in the aerial circuit is a model G-1, the one used as a grid bias is a G-5 and the one between the regenerative and the grid of the radio frequency tube is the model N or neutralizing condenser.

To properly adjust the grid condenser use the same method as described for the grid condenser in connection with the Neutrodyne circuit. It will be found that the proper condenser value at this point will be of material assistance in the neutralization of the circuit.

To neutralize the receiver insert the phone plug in the detector jack with the radio frequency tube in its socket. Tune in a strong signal placing the tickler coil just below the point of oscillation. If the filament of the radio frequency tube is controlled by an Amperite remove it from its mounting, if not, remove the radio frequency tube and placing a piece of paper over one of the filament prongs, return to its socket. Take a long handled screw driver and turn the adjusting screw of the Vario Denser counter clockwise as far as it will go. Now, turn the screw clockwise slowly until a "pluck" is heard in the head phones. At this point the signal that you previously tuned in should be at its minimum. Replace the Amperite or remove the paper from the filament prong of the socket, as the case may be. If the receiver howls, turn the screw on the Vario Denser clockwise slightly until the howling ceases.

The Vario Denser in the aerial circuit is adjusted for maximum volume and clarity while the set is in operation.



This is the "Fixed Tickler" capacity controlled circuit recommended for use with the Aero Products plug in coil.

The Vario Denser in the grid circuit is a G-5 which allows capacity variation, the necessity of which is due to the difference in tubes. The Vario Denser shunted across the grid tuning condenser is a model G-1 which makes it possible to tune from 13 to 725 meters with Aero interchangeable coils.

Constructional details can be had in booklet form from us or Aero Products, Inc., 1772 Wilson Ave., Chicago, Ill.

Gentry, Richard, W7RRG, P O Box 9274, Phoenix, AZ, 85068, 602-944-3019, desertrg@aol.com

Godsey, Lloyd, KK7IZ, 1315 N. Udall Circle, Mesa, AZ, 85203, 480-620-7145, kk7iz@cox.net

Gregg, Ralph, 2100 E Carson Dr, Tempe, AZ, 85282, 480-897-9337, ralphgazz@hotmail.com

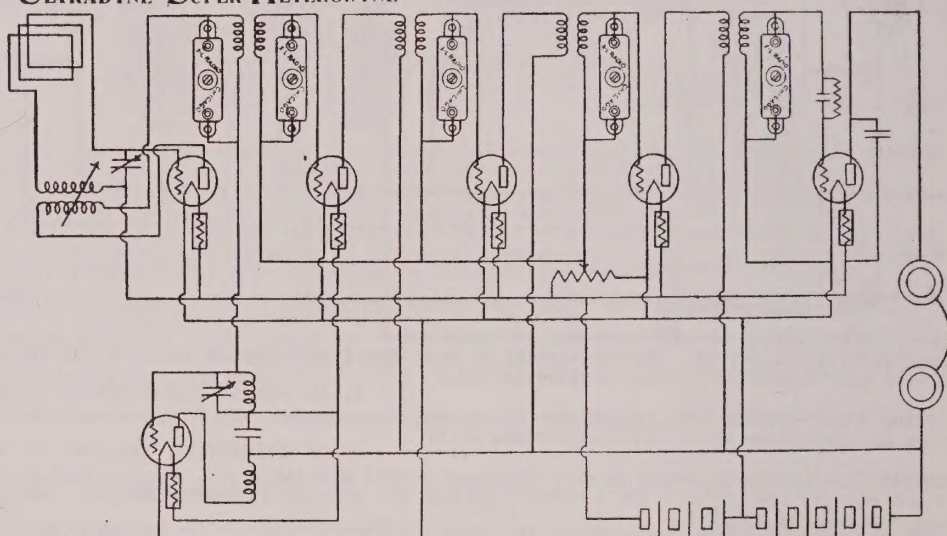
Grinder, Robert, 7735 N Ironwood Dr, Paradise Valley, AZ, 85253, 480-948-2743, atreg@asu.edu

J. E. Anderson, prominent New York engineer, makes the following statement:

"The purpose of a condenser connected in series with an antenna is to reduce the effective capacity in that circuit so that the circuit may be tuned to shorter waves. It is used either when the inductance in the antenna or the self capacity of the antenna is too great. Since the condenser is in a tuned circuit, or an approximately tuned circuit, it should be a low loss condenser, with either air or mica as dielectric. The required size depends on the loading inductance coil, on the capacity of the antenna and on the wave length of the signal."

Use an X-L VARIO DENSER in your antenna circuit and adjust it to the required capacity.

ULTRADYNE SUPER-HETERODYNE



"It gives me great pleasure to report to you the results obtained by the use of your Vario Densers. I am using them to tune the intermediate frequency transformers in my Ultradyne and they certainly make the set everything it should be."

REX E. JACKSON, Seattle, Wash.

DIRECTIONS.—The Vario Denser used across the primary of the input transformer is a model G-10, the one across the secondary, a model G-5, and the three across the secondaries of the intermediates are also model G-5.

Accurate tuning of intermediate frequency transformers can be brought about only with laboratory equipment. The object being to have all I. F. tubes go into oscillation at the same point on the potentiometer, each stage should be tuned with the tube that is to be used in the individual circuit. We are, however, giving two simple methods of tuning the transformers, the latter being quite efficient.

For the first method turn adjusting screw almost entirely in on the G-10 Vario Denser. Then turn the adjusting screws on the four G-5 Vario Densers all the way in and back up one and one-half turns. This adjusts the G-10 to about .001 MFD and the G-5 units to about .00025 MFD. To adjust the two Vario Densers on the input transformer tune in a station loud and clear. Now reduce the volume with the volume control until the signal is barely audible. Adjust the two Vario Densers one way or the other in very small steps until maximum volume is obtained. This same method is then used to tune the three I. F. condensers. Retune the set, cut down the volume and turn the adjusting screws on the Vario Densers slightly one way or the other until the best co-ordination is obtained. The Vario Densers can then be adjusted slightly on a weak distant station.

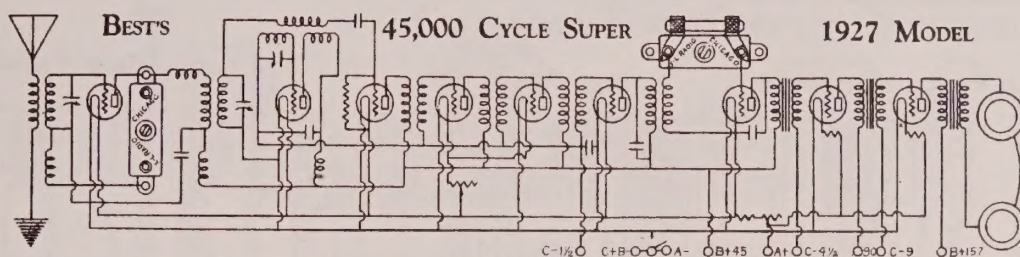
For the second method adjust the Vario Densers as advised at the beginning of the former method. Then use the same method for tuning the input transformer. The next step is to adjust the three I. F. units. Take all the tubes from the set except the second detector and the I. F. tubes. The latter should be the best three of the available tubes. Now with all the batteries connected put head phone plug in the detector jack. Place the potentiometer in a non oscillating position, and tap the grid terminal of each of the I. F. tubes consecutively to see if any one is oscillating. This condition will evidence itself by clicks of increased volume when the grid terminal is tapped. If none oscillate, carefully advance the potentiometer a little at a time and continue to tap each grid in succession until the point is found where one does go into oscillation. Then it is only necessary to adjust the Vario Densers on the other two stages, slightly, until these tubes go into oscillation at the same point on the potentiometer as the other one. Further adjustment is unnecessary as this is the ideal condition. The Vario Densers tuning the input transformers, however, may be readjusted slightly for better results.

Groesser, J B, 6817 E 45th, Tucson, AZ, 85730, 520-747-9675

Hartson, Ted, WA8ULG / N7XVH, 13631 E Montgomery, Scottsdale, AZ, 85262, 928-998-2007, ted@7vsb.com

Haslup, Jack, 17320 N 77th Wy, Scottsdale, AZ, 85255, 480-502-5791, Jackhaslup@aol.com

Heikkila, Eino, 4106 W Beryl Ave, Phoenix, AZ, 85051, 623-939-5054, W7tbu@aol.com

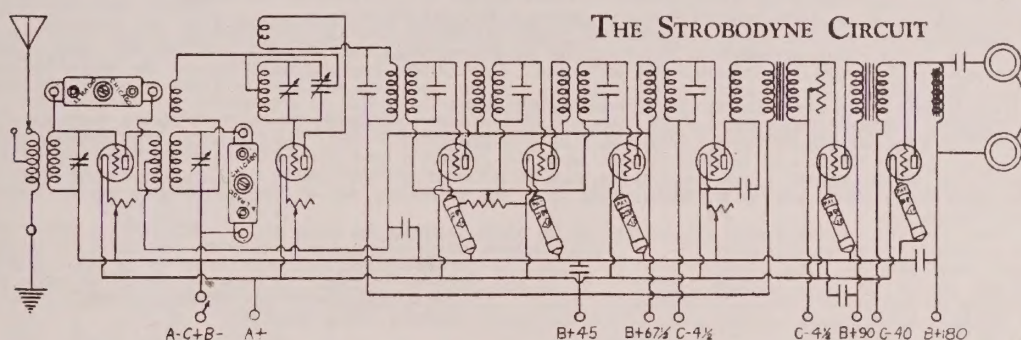


The Vario Denser in the detector grid circuit is a model G-5 which is adjusted for greatest volume on a weak signal. The other Vario Denser in the circuit is a model N which is used as a radio frequency feed-back condenser.

After the rotors of the plug in coils have been adjusted, proper setting of the Vario Denser is simple. Tune in a distant station below 250 meters and adjust the volume control somewhat below maximum volume. Now turn the screw in the Vario Denser in clockwise fashion until a hissing sound indicates that the tube is in oscillation. Then back the screw up slightly and you have the point of maximum sensitivity.

Do not attempt to make the adjustment on a higher wave length, for if the adjustment is made at 500 meters, the radio frequency tube will surely oscillate on the lower waves.

Constructional details of this receiver were published in the February, 1927 issue of Radio.



This French super-heterodyne creation uses an entirely new frequency changer, operating on a new and original principle. Out-performing the best super-heterodynes in use today, unexcelled distance, greater selectivity, remarkable sensitivity, stations at but one point on the dials and tremendous volume with no distortion are some of the claims for this receiver.

The two Vario Densers shown in the circuit are the model N. The one, attached to the grid end of the first coil, which we shall call number 1, is used as an oscillation control. The one across the second tuning condenser is a trimmer. This we shall call number 2.

Before attempting to tune in signals, turn the adjusting screws of the Vario Densers all the way in. Then back up the screw in number 1, one and one-half turns (this adjustment should be about correct although it may need a slight readjustment should the set oscillate) and in number 2, two turns. These are the approximate settings. Next set the "two stator" balancing condenser so the rotor is equally meshed with the two stators.

After these adjustments are made, turn the three rheostats on almost full and set the potentiometer so that the sliding arm is about in the center. Do not forget to turn the volume control up also. Then turn the two dials simultaneously to about the same readings.

To adjust everything to the point of greatest efficiency tune in a weak signal or use only a few feet of wire as an aerial and listen in with a pair of phones plugged in the first stage jack. Then readjust Vario Denser number 2 with a small wooden handled screw driver until the signal is loudest. The weaker the signal, the easier it is to notice the point of best adjustment.

Next readjust the three rheostats for best reception and leave them at this point. Adjust also the balancing condenser and the coupling of the tapped coil, until the weak signal comes in best. These adjustments, once made, need not be varied.

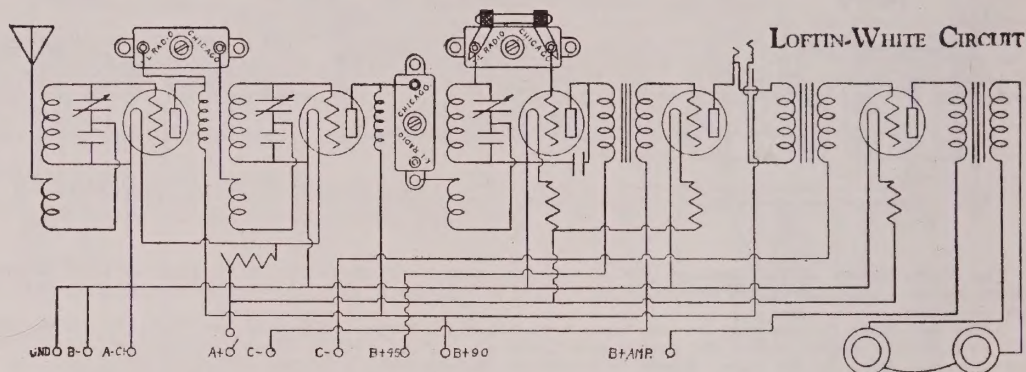
Constructional details of this receiver were published in the August, 1927 issue of Radio News. Reprints may be had from them

Higgins, Gerald, W7ES, 8602 Dogleg Dr Box 5345, Carefree, AZ, 85377,
480-488-2650, Ghigg93225@aol.com

Hilton, Mike, 401 N Schrader Ln, Tucson, AZ, 85748, 520-722-1187,
Mhilton2@mindspring.com

Hollander, David, N7RK, 2007 E. Orangewood Ave, Phoenix, AZ, 85020,
602-997-2471, n7rk@cox.net

Huisinga, Ron, 17425 N 16th Dr, Phoenix, AZ, 85023, 602-942-0598,
Ron@huisinga.org



The claims for this circuit are, extreme selectivity and sensitivity, easy tuning, even amplification over the entire wave band and an unsurpassed tone quality.

All three Vario Densers in this circuit are the model G-5. The one in the detector grid circuit is adjusted for maximum volume on a weak signal. The two other Vario Densers are adjusted as follows.

The regulating screws on the two Vario Densers should be tightened as far down as they will go. The set will now squeal on every broadcast station between 200 and 547 meters.

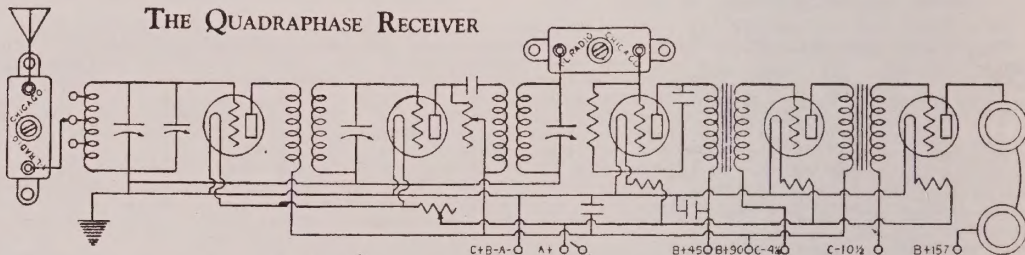
Next turn the two dials to a station that causes a squeal near 65. Then loosen the set screw on the right hand tuning condenser shaft at the front end of the coupling and turn the coupling disc with one hand while holding the right hand knob with the other. Move these back and forth until the squeal comes in loudest, then tighten the set screw in the coupling. If the squeal is too loud to judge by, turn the volume control rheostat to the left and then make that adjustment.

Turn the volume control to the right again and turn both condenser knobs to a squeal near 15 on the dial. Then turn the volume control to the left until it disappears. Next turn back to a squeal near 90. If the squeal is still there, turn back to 15 and move the primaries into the secondaries until the squeal comes back at 15. If the squeal is not there at 90, turn back to 15 and turn the volume control to the right until the squeal comes back and no further. Then raise the primaries out of the secondaries slowly until the squeal disappears.

Now turn the volume control all the way to the right, leaving the dials on 15. Next take a screw driver and alternately turn the screws in the two Vario Densers, one-quarter of a turn to the left until the squealing stops. Now turn the dials slowly across the scale. If no stations squeal, but come in as they should all the way across the scale nothing further need be done in that respect. If they do squeal at some point, loosen up on the Vario Densers alternately, a quarter turn at a time, until the squealing stops.

Constructional details of this receiver may be had in pamphlet form from us.

THE QUADRAPHASE RECEIVER



Both condensers shown in this circuit are the model G-5. The one in the detector grid circuit is adjusted for maximum volume on a weak signal. The Vario Denser in series with the antenna is adjusted for best results while the set is in operation. This adjustment will vary with different lengths of antenna.

With reference to the Browning-Drake circuit, Arthur H. Lynch says, "The grid-leak and grid-condenser have a marked effect on the regeneration control. If the grid-leak is quite large, say five to eight megohms, and the grid condenser has a capacity of from .0001 to .0005 MFD., a smooth control of oscillation is obtained. The exact size cannot be specified for all tubes, as their characteristics differ materially.

However, it has been found that a grid-condenser considerably smaller than the standard size of .00025 MFD. may be used to advantage. A larger grid leak may be used with this condenser without damaging the quality of the signals received.

Use an X-L model G-5 VARIO DENSER in your grid circuit and adjust it for 100% efficiency.

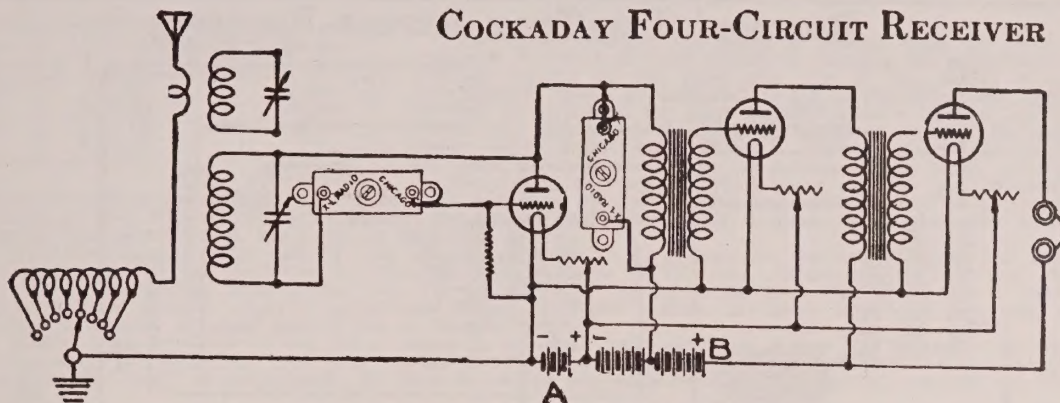
Hyder, Harry, 1638 W Inverness Dr, Tempe, AZ, 85282, 480-961-2367

Jeffrey, Bill, W7WHJ, 12205 E Lupine Av, Scottsdale, AZ, 85259, 480-767-9278, wjeffrey@alum.mit.edu

Jelinek, Tom, 6916 E. Granada Rd, Scottsdale, AZ, 85257, 480-947-2828, office@losarcos.org

Jerome, Norman, 2914 W Campo Bello Dr, Phoenix, AZ, 85053, 602-993-6766, Normmaryj@juno.com

COCKADAY FOUR-CIRCUIT RECEIVER



“After five months of experimenting I am glad to say your model G Vario Denser does the trick in my Cockaday set. The set is really a wonderful radio and now does all that is claimed for it.”
O. C. BASSETT, Waukesha, Wisc.

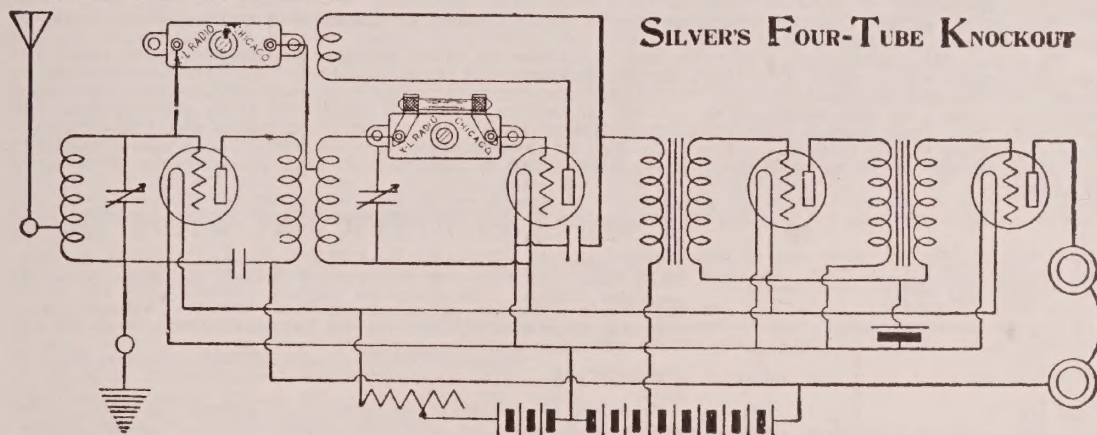
DIRECTIONS:—The Vario Denser in the grid circuit is a model G-5, the one across the primary of the first audio transformer, a G-10.

To adjust the grid condenser use the same method as described for the grid condenser in connection with the neutrodyne circuit.

To adjust the Vario Denser across the primary of the transformer turn the screw in anti clockwise direction until it is entirely out. Then screw it in about four complete turns. Now adjust the Bradley-leak so that the plunger barely makes contact with the internal elements. Slight pressure is felt at this point as the knob is turned in, or, if the tubes are turned on, there will be a rattling sound when the plunger comes in contact with the discs inside.

Setting the two instruments in this manner will give the maximum regeneration and selectivity. If there is too much regeneration at these settings, either or both may be turned a little further in a clockwise direction after making sure that the over-regeneration is not due to wrong adjustment of the rheostat or potentiometer in the detector circuit.

SILVER'S FOUR-TUBE KNOCKOUT



“I use your model N Vario Denser to neutralize the Silver circuit and for this purpose it is the best, in fact the only satisfactory condenser which I have been able to find.”

S. A. RUSSELL, Syracuse, N. Y.
DIRECTIONS:—The Vario Denser in the grid-circuit is a model G-5. The Vario Denser between the grid of the radio frequency tube and the tap on the stator of the vario coupler is the model N used to neutralize the radio frequency stage.

To adjust the grid condenser use the same method as described for the grid condenser in connection with the Neutrodyne circuit.

To neutralize the set tune in a station on the lower waves or with little of either condenser in use. When the clicking or squealing is noticed, the Vario Denser should be adjusted in small steps until this clicking or whistling disappears. The set is then neutralized. If the set cannot be neutralized on an outdoor antenna, the two lower lugs on the vario coupler should be reversed, and if this does not help, one or two turns may be pulled off the small winding connected to these lugs and fastened inside the vario-coupler stator coil.

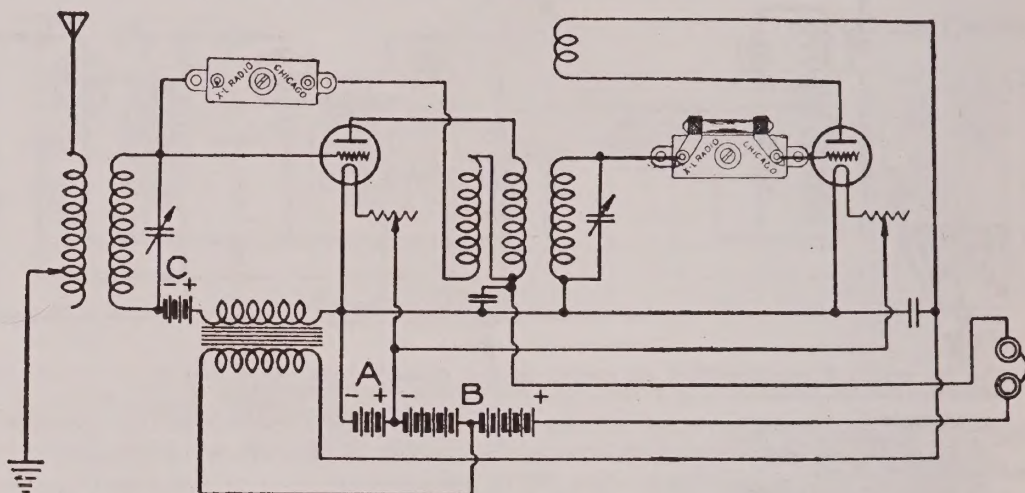
Jeseritz, Larry, 1033 W Isleta, Mesa, AZ, 85210, 480-839-0113, Oldjez@yahoo.com

Jones, Albert, W1ITX, P O Box 97, Crescent City, CA, 95531, 707-464-6470, Alk6dia@charter.net

Kafka, William, W2YAV, 368 Tamarack Ln, Prescott, AZ, 86301, 520-778-2983

Kaufert, Vern, 1403 W. Broadway #346, Apache Junction, AZ, 85220, 480-983-3546, vrkaz@juno.com

ROBERTS' TWO-TUBE REFLEX RECEIVER



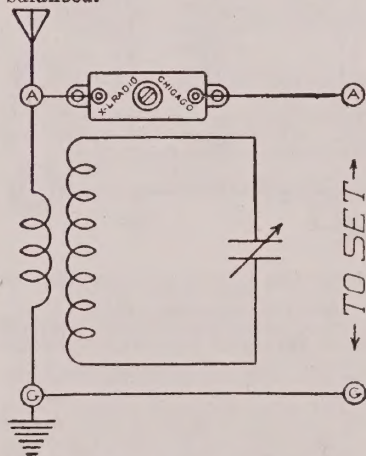
"I certainly want to thank you for having produced an efficient neutralizing condenser. My Roberts set now is certainly all that is praised for the circuit, and after vainly trying for about a year to neutralize it, your Vario Denser did the trick. Best wishes for your continued success."

PAUL D. TOWNER, Philadelphia, Pa.

DIRECTIONS.—The Vario Denser used in the grid circuit is a model G-5. The one connected between the special winding of the plate coil on the radio frequency transformer and the grid of the first tube is a model N.

To properly adjust the grid condenser use the same method as described for the grid condenser in connection with the Neutrodyne circuit.

To adjust the neutralizing condenser turn the screw so about half the capacity is being used. Rotate the tickler coil or rotor of the left hand inductance unit until the carrier wave of some station on about four hundred meters is heard. Then turn the other variable condenser which tunes the tapped inductance unit. As this condenser is rotated the carrier wave will change in pitch as it increases in intensity. The Vario Denser should then be adjusted to a point where the pitch of the whistle is the same regardless of the intensity. When the dial of this condenser can be rotated and no difference in the pitch of the squall is noticed as the loudest point is approached, then the receiver is properly balanced.



A SIMPLE BUT EFFICIENT WAVE TRAP

This wave trap of the acceptor type, known to many as the Jim Wells Link, has solved the interference problem for many living in localities congested with Broadcast Stations.

"The fine adjustment obtained with your unit is a decided asset in the adjustment of this trap, the success of which hinges mainly on this adjustment."

EDWARD C. MORRISON, Chicago, Ill.

DIRECTIONS.—The Vario Denser used in this trap is a model G-10.

To adjust the Vario Denser proceed as follows: With the tubes turned on and the set delivering normal volume on some station, which is interrupted by interference from another station, vary the adjusting screw of the Vario Denser until this interference is eliminated. It will be necessary first to tune the set and the wave trap very accurately to the station that you wish to hear before attempting to adjust the Vario Denser. If the receiver is of the regenerative type, which is capable of oscillating, care should be taken to keep the receiver just below the oscillating point. When the interfering station has been reduced as much as possible by careful tuning of the set and trap it will be found that the proper adjustment of the Vario Denser will effectively blot out any remaining trace of the interfering wave. The adjustment of the Vario Denser is quite critical, but if carefully made, no further attention need be given it.

Constructional details and blue prints of this unit may be had for 25 cents from the Consrad Company, 230 Fifth Ave., New York City.

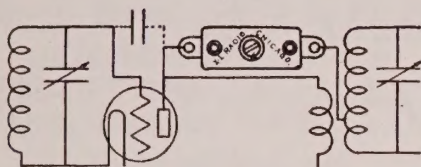
Kelly, James, 20 Tahitian Dr, Ellenton, FL, 34222, 941-721-6014

Kenan, Larry, KO6SM, 9470 W. Tonto Ln, Peoria, AZ, 85382, 623-566-9132,
llkenan@mindspring.com

Kerns, Frank, 7832 E. Pleasant Run, Scottsdale, AZ, 85258, 480-699-7218,
fbkerns@cox.net

Kinzie, P A, 410 Goldroad Ave, Kingman, AZ, 86401, 928-753-5298

Kitzrow, Tom, 4220 N. Summerset Dr, Tucson, AZ, 85750, 520-731-1101,
tomkitzrow@aol.com



The circuit diagram will assist in making clear the method employed in the neutrodyne circuit in bridging the objectionable capacity created by the plate and grid of the R. F. tubes. This capacity which is illustrated as C-1 in the dotted line, will, through fluctuation of the plate current, allow a current to flow across and impress itself on the grid, thence through the condenser circuit back to the filament. This reinforces the original plate current and sets up oscillations in the whole system.

To reduce the capacity from plate to grid, the Hazeltine method introduces a potential opposite in effect and equal to that causing the oscillation. This potential, opposite to that of the primary is obtained by tapping the secondary at a proper point some few turns from the low potential end, shown by the line and C-2.

This should make clear that in this as well as in other R. F. circuits, we are balancing out only such oscillations as are generated by the grid plate capacity of the tube. Knowing this and that the capacity of the average tube ranges from 4 to 8 MMFD, it can be readily seen that the model N Varlo Denser with a variable capacity adjustment from 1.8 to 20 MMFD, is easily capable of reaching a capacity to balance or equal that of the R. F. tube elements.

Hence, while capacity of the Varlo Denser is advanced from minimum during the balancing process, if the signal increases over the entire advance, it is a sign that a capacity has been created, somewhere in the circuit in constructing the receiver, which impresses the required opposite potential on the grid circuit.

A careful survey of the receiver and a study of the relative position of the parts or placing of wire runs will doubtless reveal the cause and the necessary changes will be well worth while in achieving the desired results.

The point at which the secondary is tapped has some effect also. The exact number of turns to tap off is largely a matter of experiment as it varies in coils of various construction although between 10 to 15 turns from the low potential end seems to be the average. Most coils sold for home constructed sets are tapped for this purpose but in many cases can be improved upon by experiment due to the difference of conditions entering into the construction of the receivers.

If, during the process of neutralization, no signal is heard with the filament off, or the adjustment of the Varlo Denser has no effect, losses have been introduced into the circuit damping the energy to a point where it cannot oscillate. This may be due to poor coil construction, faulty insulating material in tuning condensers, etc.

If the receiver oscillates after it has been neutralized, an existing condition of mutual inductance between the R. F. stages or a capacity or inductive coupling between input and output wiring causes feedback. This must be located and eliminated. The most common cause of these is coils placed so close as to be in the field of one another. The remedy for this is to spread the coils further apart or shield between stages although in some cases, by rotating the coils to various angles, a position can be found where there is a minimum of coupling.

All plate and grid wires should be as short as possible and well separated. It is bad practice to run these wires parallel for any length. Grid returns should be run direct to the socket terminal rather than to a common buss wire.

Quite often, reversing the primary leads to the middle transformer of a 3 stage R. F. job will be of material assistance in curbing mutual inductance.

Probably the simplest test to determine a condition of mutual inductance or regenerative feedback is to remove one or more of the R. F. tubes from the sockets without shutting down or disturbing the rest of the circuit. If the signal still keeps coming in with the R. F. tubes removed, it is certain that energy is being coupled back to the detector tube by stray magnetic fields or by capacity coupling through the circuit.

In a multi-stage R. F. receiver, if the signal can be balanced out in one stage and not in the other, switch the Varlo Densers and if the trouble remains in the same stage the fault lies in the receiver and not in the Varlo Denser.

In circuits in which the filament voltage must be cut off from the tube when balancing and the socket is of such type that will not permit use of paper over the filament prong, either disconnect one of the filament leads to the socket or substitute a burned out tube of the same make as the one being balanced, at the times when the filament is to be unlighted.

A tuned R. F. receiver will often work better and be easier balanced with 67½ volts on the plate. Changing the tubes around will often effect the results.

Always lead antenna wire as directly away from receiver as possible.

It might be well to consider that if a condenser has its rated capacity range and is made from first class material, nothing more can be expected. If it is installed at a point in a circuit requiring a capacity within its range and it does not work, it is logical that there must be something defeating its purpose. A condenser cannot be expected to do tricks. It will not function for a capacity beyond its range nor will it work in a set so constructed that the intended purpose is impossible.

GUARANTEE

All X-L units are made of the best material obtainable. They are thoroughly tested before leaving the factory and are guaranteed for capacity, material and workmanship. If found defective and returned un-mutilated, postage prepaid, full repair or replacement will be made free of charge. Do not take them apart. Tampering voids this guarantee.

PUBLISHED BY
X-L RADIO LABORATORIES

2424-2426 Lincoln Ave.

Printed in U. S. A.

Chicago, ILL.

Knight, John, 590 E Bridal Veil Falls Rd, Tucson, AZ, 85737, 520-297-0245,
Jtknight7@cs.com

Koch, Phillip, W0ETH, 9040 N 102nd Ave, Sun City, AZ, 85351, 623-977-9137,
philipkoch@webtv.net

Krol, Ken, 1824 W Whitton Av, Phoenix, AZ, 85015, 602-604-8853,
Djkrol@earthlink.net

Lambert, David, 2125 E Ranch Rd, Tempe, AZ, 85284, 480-775-0531,
dlambert83@cox.net

- La Pierre, Steve, 1314 Gardner Rd, Fort Mohave, AZ, 86426
- Lettow, Bill, 2025 E La Jolla Dr , Tempe, AZ, 85282, 480-730-6058,
lettow@yahoo.com
- Lew, Stephen, 3813 E Calle Fernando, Tucson, AZ, 85716, 520-881-0385,
slew2969@aol.com
- Lewis, Bill, 313 E 15th St, Tempe, AZ, 85281, 480-967-3220
- Lewis, Rob, 2950 W Dobson Rd, Chandler, AZ, 85224, 480-963-8833,
Weyesguy@qwest.net
- Linden, Jerome, K7PUR, PO Box 4927, Cave Creek, AZ, 85327, 480-488-
5205, jrlinden@usa.net
- Lopaz, James, 8421 E Main # 115, Mesa, AZ, 85207, 602-373-4002
- Ludwick, Bob, 4622 E Fox Circle, Mesa, AZ, 85205, 480-924-2478,
radiodoll2@cox.net
- Mach, Douglas, 7630 Via del Paraiso, Scottsdale, AZ, 85258, 480-991-6513,
speedsound@cybertrails.com
- Malinish, Larry, 5125 North 40th St # F418, Phoenix, AZ, 85018, 602-381-
9957, lillylarry@qwest.net
- Martens, Thomas, 1736 S El Camino Dr, Tempe, AZ, 85281, 480-233-9629,
Tom@puorro.net
- Martin, John, 2105 E Stephens Rd, Gilbert, AZ, 85296, 480-892-2074,
nightsight01@getnet.net
- Mathews, Richard, 5125 W Bluejay St, Tucson, AZ, 85742, 520-744-8661,
Rdmath@mmla.com
- Miller, Craig, 1592 E Morelas St, Chandler, AZ, 85225, 480-855-5956,
Millerclan6@cox.net
- Morelli, Carl, 3333 W Thunderbird Rd #2043, Phoenix, AZ, 85053, 602-
942-8291, Carl.morelli@bull.com
- Morton, Con, 14043 N 57th Wy, Scottsdale, AZ, 85254, 602-996-8912,
corneliusm@cox.net
- Mountjoy, Rick, 1350 W Stratford Av, Gilbert, AZ, 85233, 480-926-8174,
rmountjoy@cox.net
- Nelson, Dan, 1084 E Senate Circle, Chandler, AZ, 85225, 480-814-8827,
Djn@ieee.org

Oboyl, Steve, 1628 E El Parque, Tempe, AZ, 85282, 480-966-9521,
steveoboyle@yahoo.com

O'Day, Dennis, 9360 E. Dallas St., Mesa, AZ, 85207, 480-984-8803,
ron2it@earthlink.net

Ooms, Andrew, P O Box 1975, Pine, AZ, 85544, 520-476-2164,
oomspine@cybertrails.com

Palmer, Charles, N4GXU, 167 Tierra Encantada, Corrales, NM, 87048, 505-
899-5585, Capalmer22@cs.com

Payne, Bernard, VE6OR, 220 Paliswood Park SW, Calgary, Alberta, T2V5J4,
403-281-4341, Teddy115@telusplanet.net

Pearce, Mike, 2411 N 18th Dr, Phoenix, AZ, 85007, 602-253-1724, mike-
mad@cox.net

Petrofes, Mike, 176 Big Horn Ridge Dr. NE, Albuquerque, NM, 87122, 505-
235-7493, apetrefosi@comcast.net

Pock, Ray, 13211 W. Gaucho Dr, Sun City West, AZ, 85375, 623-556-1069,
Pookie15@mindspring.com

Powell, Donald, HC-5 Box 76-D, Payson, AZ, 85541, 520-474-2701

Price, Vaughn, 2314 E Enrose St, Mesa, AZ, 85213, 480-962-4342,
Vprice4342@aol.com

Randall, Bill, 3421 N Stone Gully, Mesa, AZ, 85207, 480-218-4667

Rayner, Lester, 5512 N 71st Pl., Scottsdale, AZ, 85253, 480-947-1375,
LesParizona@aol.com

Reek, Bob, 765 Malia Wy, Prescott, AZ, 86303, 928-776-1013, bobreek@aol.
com

Roberts, Carl, 8749 E Via de la Gente, Scottsdale, AZ, 85258, 480-998-0680,
Tswcarl@netscape.net

Sanders, Steve, P O Box 609, Sierra Vista, AZ, 85636, 520-456-1093

Schiffer, Michael, 2718 E 10th, Tucson, AZ, 85716, 520-325-3532,
Schiffer@u.arizona.edu

Schmidt, Frank, 1185 E Via Entrada, Tucson, AZ, 85718, 520-888-4186,
Clorad@aol.com

Schroeder, Mark, 8837 W. Potter Drive, Peoria, AZ, 85382, 623-537-4021,
w7khz@earthlink.net

Schwenker, Rowland, 969 W. Roosevelt, #1, Apache Jctn, AZ, 85220, 480-228-1116

Scofield, Larry, 807 W Keating Av, Mesa, AZ, 85210, 480-831-6165, lscof29749@aol.com

Seymour, Ray, 1509 N Oak St, Tempe, AZ, 85281, 480-970-8943, All41509@aol.com

Shepard, Mark, H C 1, Box 433, Elgin, AZ, 85611, Mark471marks@netscape.net

Shields, Jeff, N9CZA, 1820 W Raven Dr, Chandler, AZ, 85248, 480-855-1282, jeffandkt@msn.com

Sievers, Maury, 612 E Winter Dr, Phoenix, AZ, 85020, 602-943-8964

Silver, Martin, 3076 N Lynx Lake Dr, Prescott Valley, AZ, 86314, 928-759-0706, silverway@earthlink.net

Simons, Steve, 1732 E. Verde Ln, Phoenix, AZ, 85016, 602-265-2253, stephen.simons@medtronic.com

Smith, Bob, 5701 N. 43rd Ln, Glendale, AZ, 85301, 623-937-2827, bnbsmith@cybertrails.com

Smith, Steve, 9204 S Kachina Dr, Tempe, AZ, 85284, 480-831-3095, Radio747@yahoo.com

Sovic, Mike, 1053 E. 11000 S, Sandy, UT, 84099, 801-572-6836

Speir, David, 8051 S Old Canyon Av, Tucson, AZ, 85747, 520-574-8239, Dspeirsprint@earthlink.net

Stencel, Larry, 9176 N 115th Pl, Scottsdale, AZ, 85259, 480-661-6722, Lassoman@msn.com

Stern, Arthur, 606 N Oakhurst Dr, Beverly Hills, CA , 90210, 310-278-3220

Stih, John, KD7CUZ, 1701 W Monterey, Chandler, AZ, 85224, 480-821-5757, Jstih@inficad.com

Stoltz, Bruce, 11541 E Calle Del Rincon, Tucson, AZ, 85749, 520-760-0553, Stoltz6@worldnet.att.net

Stout, Dick, KE7RD, 9980 Willow Pt, Sun City, AZ, 85351, 623-815-0985, Ke7rd@webtv.net

Sundblom, David, 381 E White Wing Ct, Casa Grande, AZ, 85222, 520-836-4821, Dsndblm@excite.com

Synovetz, Harry, 751 S Front Royal Dr, Tucson, AZ, 85710, 520-909-2433,
Prisoner2@mindspring.com

Tannenbaum, Michael, 1001 W. Camino Delicias, Green Valley, AZ, 85614,
 520-399-3504, k2bn@cox.net

Thomas, Jeff, 2041 E Cortez Dr, Gilbert, AZ, 85234, 480-926-6156,
Jthomas@amug.org

Thorpe, Bruce, N7MMR, 11 East Ashland, Phoenix, AZ, 85004, 602-257-
 8543, tubefiend509@hotmail.com

Toombs, Dean, 5001 E Fanfol Dr, Paradise Valley, AZ, 85253, 480-483-2970,
Dandptoombs@cs.com

Toppo, Mark, 5127 W Kings Av, Glendale, AZ, 85306, 602-439-3556,
lynntoppo@cox.net

Ulich, Bobby, 3500 N Country Club Vista Pl, Tucson, AZ, 85750, 520-529-
 0253, Ulich-eodc@kaman.com

Vaughn, Dave, 449 West 29th St, Tucson, AZ, 85713, 520-790-2618,
davesantiqueserv@qwest.net

Vendeville, Ed, 13125 N 24th Ave, Phoenix, AZ, 85029, 602-866-0174,
Evende@cox.net

Vernon, Robert, KG8YP, 70747 M62 S, Edwardsburg, MI, 49112, 616-663-
 6812, irmrradio@aol.com

Vinyard, Ed, 833 W Coral Gables, Phoenix, AZ, 85023, 602-993-7666

Vogler, Sheila, 1135 E Smoot Dr, Tucson, AZ, 85719, 520-887-6977,
F_vogler@hotmail.com

Walrath, George, 9366 E Kiva Ave, Mesa, AZ, 85212, 480-354-1301

Waskel, Joe, 26606 S Pear Tree Dr, Sun Lakes, AZ, 85248, 480-895-1473

Watson, Allen, 625 Lake Side Circle, Edmond, OK, 73003, 405-348-5309,
alndotw@juno.com

Watson, Clyde, 8311 Via de Sereno, Scottsdale, AZ, 85258, 480-948-6466,
clydelois@earthlink.net

Watson, Lois, 8311 Via de Sereno, Scottsdale, AZ, 85258, 480-948-6466,
clydelois@earthlink.net

Way, Peter, 5538 E.Sandra Terrace, Scottsdale, AZ, 85254, 602-840-7184,
Bakeapple@earthlink.net

Weiss, Leonard, 9942 W Tonopah Dr, Peoria, AZ, 85382, 623-572-2794,
Leninfo1@pngusa.net

White, Jack, 2919 N. Ricardo St, Mesa, AZ, 85215, 480-218-0424,
jmw2@cox.net

Wiersma, Ted, 4761 W. Villa Maria Drive, Glendale, AZ, 85308, 602-843-3092, wiersma7@cox.net

Wilson, Robert, 2038 W Ronald Rd, Phoenix, AZ, 85029, 602-997-6526,
Robertwilson13@netzero.net

Wiltzie, Corinne, 3006 N 78th St, Mesa, AZ, 85207, 480-357-8954,
cwiltzie@earthlink.net

Yubeta, Richard, P O Box 1495, Oracle, AZ, 85623, 520-896-2555

Zierold, Nelson, 1337 N Raven, Mesa, AZ, 85207, 480-396-2058,

Want to Buy: Working driver & base for an AK Model L horn speaker and same for Stewart Warner horn speaker. Also, buying cylinder records and phonograph parts, dead or alive Edison, Columbia players. Tucson area but may travel. Harry Prisoner2@mindspring.com



Blue Ribbon Restorations

"Old-time craftsmanship makes your radios new again"

- Complete wood cabinet refinishing with proper shading & toning for that "factory-new" appearance
- Veneer repairs from patches to total cabinet re-veneer
- Pattern-matched veneer to simulate damaged photo-finished panels
- Bakelite repair and repainting
- Total electronic chassis restoration
- "Impossible" restorations taken on
- Fabrication of small wood items [radio or other]
- 12 years' experience from an "award-winning radio craftsman"

"Before you relegate that set to the parts bin, bring it to Blue Ribbon Restorations"

Ken Krol

602.604.8853 djkrol@earthlink.net

